M A N U A L

SIMRAD EQ42/50/52

Echosounder

183-0300-202 English

02244.30

1830300202

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1.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD EQ42/50/52 MKII Echosounder and Fishfinder**. Great care has been taken to create this innovative video sounder … both in design and performance.

The EQ42/50/52 MKII is a unique new slim-line product in the Simrad Marine Line, and is available with a 10" ATFT (EQ42), 14" TFT (EQ50), or 15" TFT (EQ52) large LCD display in color.

The echosounder system with selectable frequencies will provide an impression of Bottom expansion, VRM expansion, A-scope and White line.

DS42/50/52 Dual Station for the EQ42/50/52 is available in 10" ATFT color, 14" or 15" TFT color.

How to use this manual? The manual is written for the products: EQ42, EQ50 and EQ52, which all share the same type of software. From hereon, these models are referred to as: **EQXX**.
It is a good idea if you make yourself familiar with the key functions, menu structure and rotation of pages (screens) described in chapter 2 before you start out, and then proceed with section 2.5 Initial start-up. For quick location of a certain term, please check the "Glossary of terms" and the "Index" at the back of the manual.

How to interpret special marked key symbols, etc. in the manual:

+/- Either the + (plus) or – (minus) key may be applied.

0-9 Alpha-numeric keys for insertion of figures.

A-Z Alpha-numeric keys for insertion of letters.

☞ Emphasizes important points.

3,7 Indicates that you should press the keys [3] and [7] to obtain what is written in *italic* next to the keys.

1.2 Safety summary

Precaution The operating unit should not be exposed to direct sunlight, as "boiling" the display may cause too high temperatures internally and subsequently damage parts of the unit beyond repair.

Quality service personnel The EQXX is sealed and does not contain any user serviceable parts. Opening of the unit will void its warranty. Touching electrical parts inside may cause bodily harm or death. If the unit is not working properly, check sections 9.8 Preventive maintenance, 9.9 Repair and service, and 9.10 Troubleshooting. If your EQXX requires servicing or repair, call your authorized SIMRAD dealer.

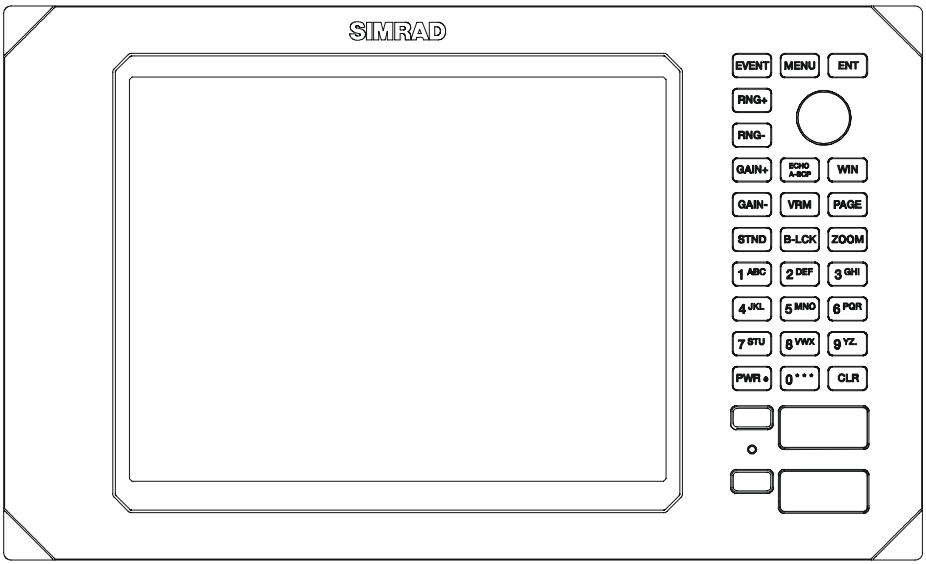
Power source, fuse and power cable Check that the DC power supplied to the unit is within the range of 10 to 32 volts. Note that the appropriate fuse must be employed (see the fuse rating in section 9.11 Specifications). Ensure that the power cord is firmly attached.

Grounding The EQXX is a sophisticated piece of electronic equipment. To reduce electrical interference and risk of electrical shock, properly ground the unit to the ship's ground using the ground screw on the back of the unit.

Glossary of terms If you have never used an echosounder before or if you are unsure of how a term is used in this manual, then turn to Appendix A – Glossary of terms.

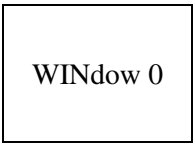
Default settings All user implemented data in the EQXX can be erased by making a reset of the unit and thus return to factory default settings.

Principles of operation The scientific principles of operation of the EQXX are explained in chapter 8. Principles of operation.

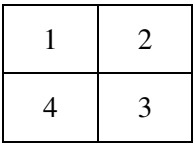


2.1 Fundamentals of the PAGE and WINdow system

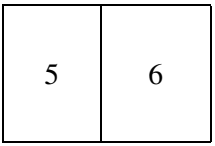
The EQXX Echosounder has a multi-function screen data presentation system. You can choose to have a full screen, or a screen divided into e.g. an echo display and two data/echo displays, etc.
The display which is currently activated is indicated by a highlighted frame around the active window. There are five screen combinations to choose from:



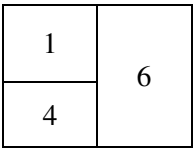
1. Full (1/1) screen.

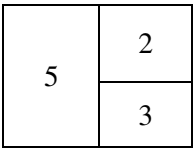


2. Four ¼ displays.



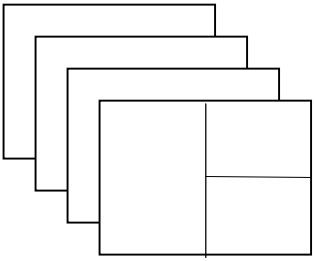
3. Two ½ displays.





4. & 5. Combination displays of one ½ and two ¼ displays.

☞ WINdows 5 and 6 are dedicated for echo displays and related setup.



As many as 4 screen combinations or full screens can be saved in four pages.

Press the [PAGE] key to toggle between the four pages, or hold the [PAGE] key depressed to start a rotation of the four pages.
Press [PAGE] again to return to manual operation.

To mix and match the various echo and data displays you wish to have in the PAGE and WINdows pesentation, you will first need to know what is pre-set from the factory:

PAGE *Scroll through the four pre-set pages* to see if you wish to exchange any of the displays with a different one.

Example of how to edit a pre-set page:

window 5	window 2	We pretend that in this page, window 2 contains the navigation display (highway), window 3 an echo display in 50kHz, and window 5 an echo display in 200kHz.
	window 3	

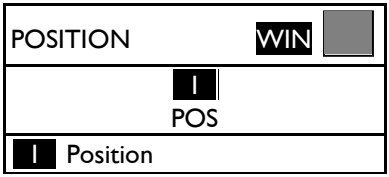
You now wish to insert the "Echosounder setup" display in window 3 instead of the echo display in 50kHz. This is the procedure:

WIN *Press the* [WIN] *key until the frame around window 3 is highlighted*

MENU *Call up the menu bar, and…*
3,8 *then call up the ECHO menu and select "Echosounder setup"*
- you will now have the "Echosounder setup" display in window 3 instead of the echo display in 50kHz.

Example of how to edit a full screen to four ¼ displays:
We pretend that you are looking at a full screen which you wish to divide into four ¼ displays. This is the procedure:

MENU *First call up the menu bar, and…*
1 *then call up the POS menu* - see example next page.



What you do now will determine which WINdow the display you are about to select will appear in.

Press the [WIN] key repeatedly to scroll through the window system.

WIN *Press the* [WIN] *key once to select window 1*
-which is the left top quarter of the screen.

1 *Select the Position display*
- you will now have the position display presented in window 1.
The rest of the windows in this page i.e. window 2, 3 and 4 will contain the displays which were pre-set from the factory. They can all be exchanged with new displays at your choice.

☞ However, the same display can not appear twice on the same page, so in case you are trying to select the same display in a second window, this is what will happen:

As per above example, you have selected the Position display in window 1, but it may just happen that the Position display was pre-set to window 2 – therefore window 2 will now show the legend: " Select display via MENU."

You may select the same display to appear on different pages, but not on the same page.

2.2 Key functions

A description of the key functions is available at the start-up display in the Quick guide. Some of the key functions are general and can be applied at any time, other key functions are related to a certain menu(s) and can only be applied when in the appropriate menu.

WIN Toggles between windows. The active window will have a highlighted frame. Only activated windows are operable.

PAGE Toggles between four pre-selected pages (screens). Hold two seconds for automatic rotation of pages. Press again for normal operation.

MENU Turns the menu bar on/off. Exits any data display without taking any action.

ENT Opens for/confirms insertion and editing of data. Gives access to setup displays related to main displays.

Moves cursor in data displays. Activates and moves variable range marker (VRM) up/down. Moves left and right in the menu bar.

CLR Deletes data in enter or edit mode.

EVENT Placing a vertical line at the current ping for indication of e.g. fish. Sending out WPL via NMEA – see "Event marker", Appendix A.

PWR ✸ Press and hold the [PWR] key to turn on the power. Activates menu for setting light, contrast or display colors i.e. Daylight display, Night display or custom made display. Hold two seconds to turn the power off.

RNG+ **RNG-** RANGE+ (plus) and RANGE- (minus) will adjust the scale/range of depth. +/– will toggle between available values.

GAIN+ **GAIN-** GAIN+ (plus) and GAIN- (minus) will adjust presentation of received echo. Press + till noise appears in "water", then press – till noise *just* disappears again.

ECHO A-SCP — Hotkey to Echo 1 i.e. jumps to window on the screen with Echo 1 display; if none: inserts Echo 1 in active window.
From active ECHO display: Toggles A-SCOPE on/off.

1-9 A-Z — The alpha-numeric keys inserts and selects data in data displays.

VRM — Toggles variable range marker on/off. Calls up depth indication in top line of echo displays with active VRM line.

STND — Return to STANDARD echosounder display with indication of depth and water temperature, etc.

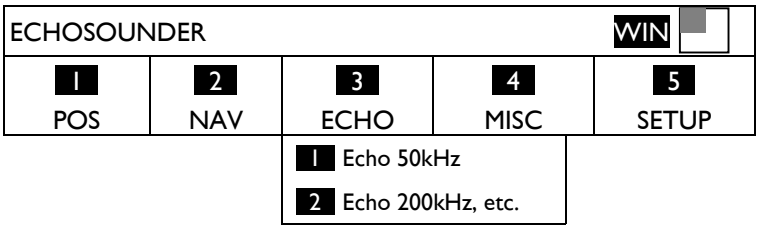
B-LCK — BOTTOM LOCK – combination screen: standard echosounder display and expanded area around the bottom. Toggles bottom lock on/off.

ZOOM — Combination screen: standard echosounder display and expanded area around the variable range marker. Toggles expanded area on/off.

2.3 Menu bar

MENU *Toggles the menu bar on/off*

To fit in the complete menu bar across the screen, some of the menus have been abbreviated. However, the last selected menu will be highlighted, and if it's an abbreviation of the menu, then the complete menu title is written above the menu bar e.g.:



Having selected e.g. 3:ECHO from the menu bar, its associated menus will drop down. Key in the number next to the function you wish to

call forward, or use the cursor key to highlight the function and press [ENT].

If you want to switch to a different menu, use the cursor key to move to the adjacent menu.
The menu bar will disappear from the screen at the selection of a function, or by pressing the [MENU] key. Besides, if not used, it automatically turns off after 30 seconds.

2.4 Menu layout

1 POS	2 NAV
1 Position	1 Highway

3 ECHO	4 MISC	5 SETUP
1 Echo 50kHz	1 DSC alarm	1 Speed alarm, units & language
2 Echo 200kHz		2 NMEA interface
3 Bottom expansion 50kHz		3 Alarm output
4 Bottom expansion 200kHz		4 Decca lanes
5 VRM expansion 50kHz		5 Loran C
6 VRM expansion 200kHz		6 Display color
7 Depth & temperature diagram		7 Factory settings
8 Echosounder setup		

Most functions in the menus are general, and can be called forward at any time, but a few are related to a certain menu(s) and can only be called forward or activated in the appropriate menu. Inactive functions in the menu will have a different color from the rest of the functions.

When selecting a sub-menu in the SETUP menu, the display will

always appear in a pop-up window. Which means that it will not take the place of another display, and it will not mess up the pre-set displays on the screen.
And once you have confirmed the changes, or just want to exit the display, the display will disappear from the screen, as you have no further use for it.

2.5 Initial start-up

PWR ✸ *To turn on the power, press and hold the* [PWR] *key till a picture appears on the screen*

PAGE *Press* [PAGE] *to scroll through a quick guide which informs of the use of the keys and where you can enter owner's setup*

ENT *Press* [ENT] *when ready to assume normal operation*

PWR ✸ *Press* [PWR] *again to adjust the lighting in the screen and select day or night display, etc., move around in display by means of the cursor key and change settings with +/- keys, and…*
ENT *Confirm with* [ENT]

Customizing the EQXX to suit individual needs can be done as you go along i.e. choose a different color for the display background, text, menu, etc. But to start out it will be wise to select the display language you prefer to use:

Select language:

MENU *Call up the menu bar, and…*
5,1 *press* [5] *and* [1] *to call up the proper display*

● *Go to the bottom line in the display*

+/- *Select language*

ENT *Confirm entry*

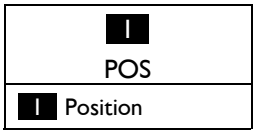
2.6 Turn power off

PWR *Call up INFO window, and…*

PWR *Press and hold until screen turns black*

The EQXX is now turned off. All data and setups are saved and stored in the internal memory and, of course, will be available next time the unit is turned back on.

3. Position menu



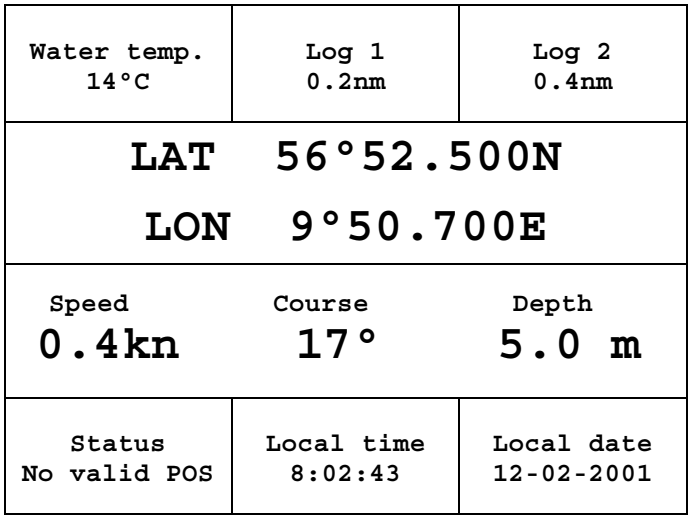
- see section 3.1.

3.1 Position display

☞ To present a position will require that the echosounder is connected to a navigator.

MENU
1, 1

Call up the menu bar, and…
load Position display



Trip log 1 and 2.

Position in three decimals in minutes.

Water speed/ speed over ground.

Course, magnetic or true.

Editing of position display

Reset log or change the start figure, adjust local time and date, change position presentation i.e. latitude/longitude, decca lanes or Loran C, change speed presentation i.e. SOG – speed over ground or STW –

water speed, and – course and bearing can be set to either magnetic or true.

ENT *Open for change*

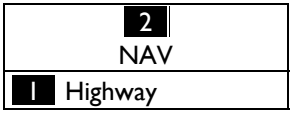
Move cursor to the value you want to change

CLR *Press* [CLR] *to reset log*

+/- *Toggle between available values, change time and date*

ENT *Confirm entry*

4. Navigation menu



4.1 Highway display

MENU *Call up the menu bar, and…*
2, 1 *load highway display*

To present any information in the EQXX highway display will require that a navigator is connected via the NMEA input port.
☞ The connected navigator must be in a navigation mode, which could be Cursor, Waypoint, Route or Track navigation. See next page.

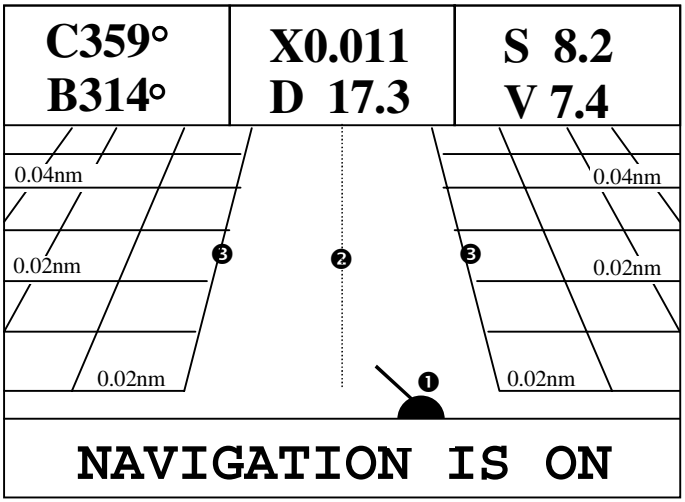
4.2 Navigation setup

ENT The navigation setup display is accessed by pressing [ENT] from the navigation display:

Alarm distance can be changed in this display, but alarm can only be initiated from the connected navigator. Maximum setting in nautical miles is 9.99 nm.

ENT *Return to the highway display*

Highway display



Nautical miles indication on horizontal lines indicates how many nautical miles there are from ship's position to the horizontal line.

C: Course over ground
X: Cross track error
S: Speed over ground
B: Bearing to approaching WP
D: Distance to waypoint
V: Speed towards WP (velocity)

Bottom line indicates name of waypoint or route.

❶ Ship's position and heading in relation to intended track.

❷ Ideal course line between two waypoints starting from ship's position when NAV is activated on connected navigator.

❸ XTE alarm lines – an alarm will sound if the ship touches the lines.

5. ECHOSOUNDER MENU

3 ECHO	
1 Echo 50kHz	- see section 5.1.
2 Echo 200kHz	- see section 5.1.
3 Bottom expansion 50kHz	- see section 5.2.
4 Bottom expansion 200kHz	- see section 5.2.
5 VRM expansion 50kHz	- see section 5.3.
6 VRM expansion 200kHz	- see section 5.3.
7 Depth & temperature diagram	- see section 5.4.
8 Echosounder setup	- see section 5.5.

5.1 Echosounder display

Low and high frequency echosounder display can be set up separately and be shown simultaneously in the same screen, but in separate WINdows. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

As an example:

MENU *Press* [MENU], *to call up the menu bar, and…*

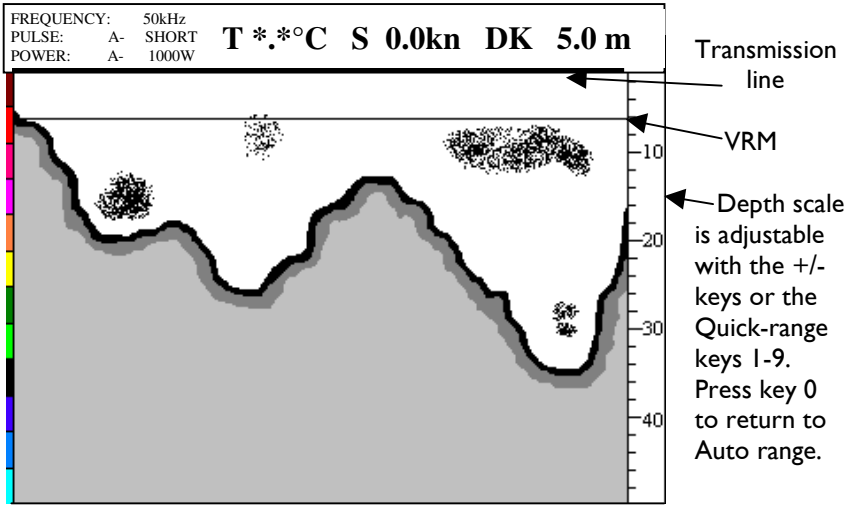
3,2 *press* [3] *and* [2] *to call up the Echo display for 200kHz*

- see display example on next page.

The top line in the display informs of: Actual temperature **T** in Celcius or Fahrenheit (in half degrees), current speed **S** in knots or kilometers/hour or miles/hour – current settings can be changed in Setup for units (MENU, 5,1). Actual depth **DK** i.e. **D**epth below **K**eel/Surface/Transducer – settings can be changed in echosounder setup (MENU, 3,8).

FREQUENCY indicates the selected frequency.
PULSE (not in ¼ size displays) indicates the transmission pulse length.
POWER (not in ¼ size displays) indicates the transmission power.
(A = AUTO)

This is the basic presentation mode (standard display) for observing fish schools and seabed. Some surface noise may appear just below the transmission line.



☞ Refer to Appendix A for further description of the various functions.

ENT — *Direct access to Setup display related to active echo display – 38kHz, 50kHz or 200 kHz* – (see section 5.8)

● — *Use the cursor to go to the function you wish to change the value for*

+/- — *Toggle between available values, and…*

ENT — *Confirm with* [ENT]

ECHO A-SCP — *Hotkey to Echo 1* (from [MENU],[3],[1]) i.e. jumps to window on the screen with Echo 1 display; if none: inserts Echo 1 in active window.

5.2 Bottom expansion

The advanced bottom lock and expansion feature ensures a reliable depth readout and provides a compressed standard display in the upper 1/2 of the display. The bottom area can be magnified for better separation of echoes. The actual size of the expansion window can be adjusted in the Setup display for 38kHz/50kHz/200kHz.

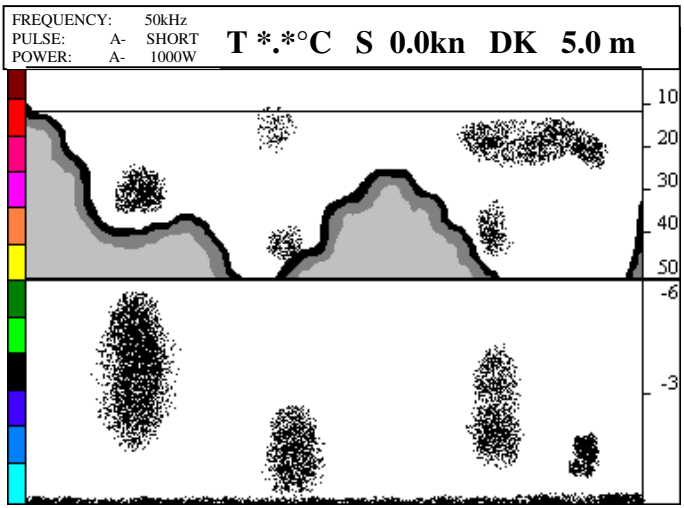
As an example, from active echo display, 50kHz:

MENU *Press* [MENU], *to call up the menu bar, and…*

3,3 *press* [3] *and* [3] *to activate bottom expansion of the 50kHz sounder*

or…

B-LCK *gain direct access to the bottom expansion feature by pressing* [B-LCK]



+/- *The depth range at the right of the screen can be adjusted by means of the + and – keys*

ENT *Open Setup display* (see section 5.8), if any changes are required

ENT *and confirm changes with* [ENT]

B-LCK *Turn bottom expansion off again*

5.3 VRM expansion

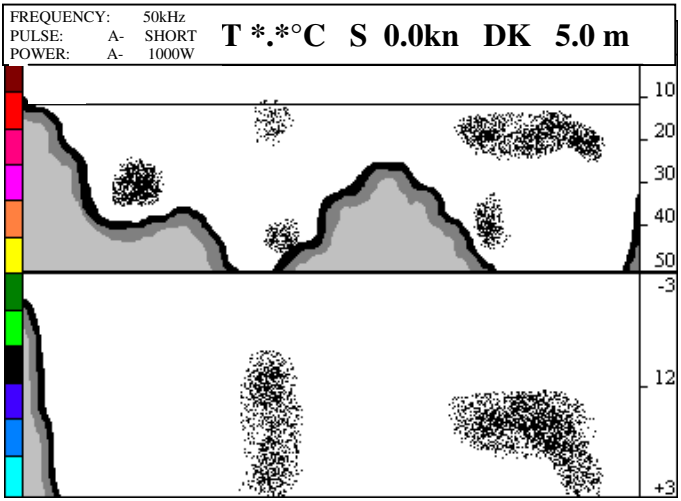
This feature will provide an expanded view of the area near the Variable Range Marker which will give a better separation of echoes. The actual size of the expansion window can be adjusted in the Setup display for 38kHz/50kHz/200kHz. As an example, from active echo display, 50kHz:

MENU *Press* [MENU], *to call up the menu bar, and…*

3,5 *press* [3] *and* [5] *to activate VRM expansion of the 50kHz sounder*

or…

ZOOM *gain direct access to the VRM expansion feature by pressing* [ZOOM]



The zoom level can be selected in seven steps ranging from 3 to 50 meters, or converting to feet or fathoms (refer to Setup for units, section 7.1). The VRM horizontal line can be moved up/down by means of the cursor.

+/- *Adjust range with the + and - keys*

ENT *Open Setup display* (see section 5.8), if any changes are required

ENT *and confirm changes with* [ENT]

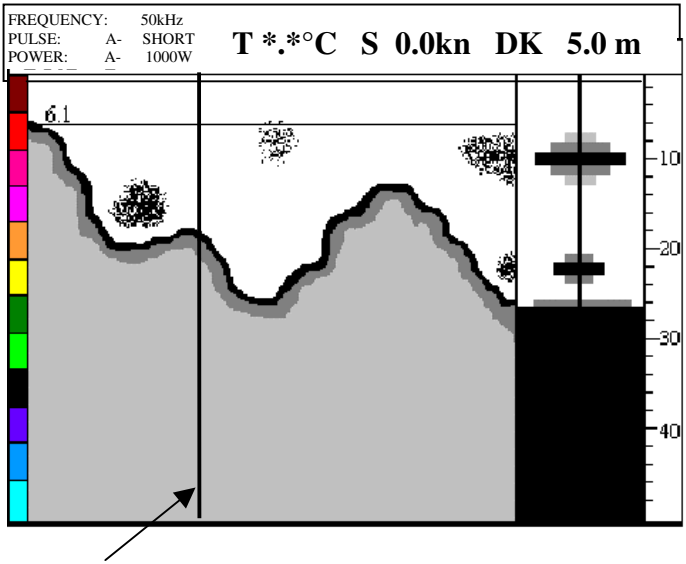
ZOOM *Turn VRM expansion off again*

5.4 A-scope

The amplitude scope which appears in the right side of the echo display, can be turned on and off.
The readout indicates the precise amplitude or strength of the last received ping (sounding), which often can be used for determining individual species of fish or hardness of the bottom.

From active echo display:

A-SCP *Gain direct access to the A-scope function*



The vertical marker in this display is activated by the [EVENT] key, see Appendix A for further details.

+/- *Adjust range with the + and - keys*

ENT *Open Setup display* (see section 5.8), if any changes are required
ENT *and confirm changes with* [ENT]

A-SCP *Turn A-scope OFF again*

5.5 Variable range marker

From active echo display:

VRM *Gain direct access to the Variable Range Marker function*

Move the variable range marker up/down with cursor key

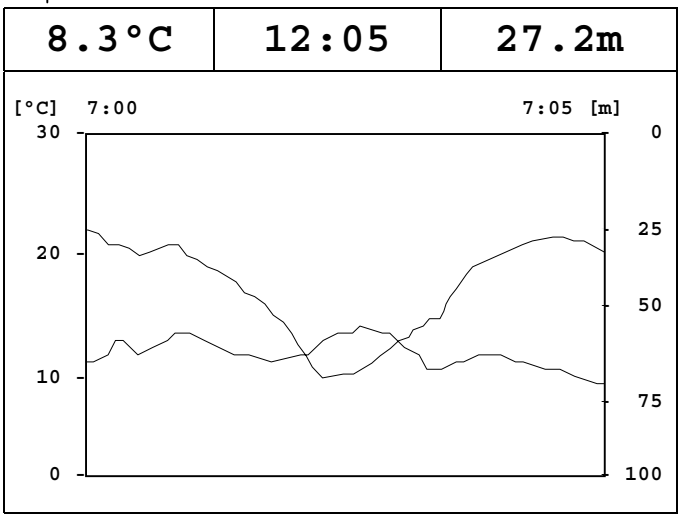
+/- *Adjust the range by means of the +/- keys*

VRM With variable range marker active, *press* [VRM] *to bring up the VRM location in the top line of the display, press the* [VRM] *key again to turn off the VRM marker*

5.6 Depth & temperature diagram

MENU *Press* [MENU], *to call up the menu bar, and…*
3,7 *press* [3] *and* [7] *to activate Depth & temperature diagram*

Present water temperature.

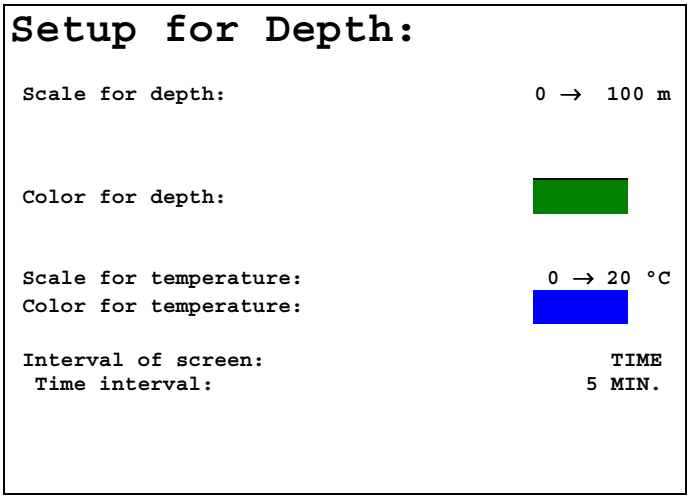


Present depth.

Depth over time or distance.

Temperature over time or distance.

ENT *Call Setup for Depth display*



● *Go to the function you wish to change*

0-9 *Key in new figure, or…*
+/- *change setting*

ENT *Confirm entry*

Scale for depth – there are six depth scales to choose from, ranging from 0-10m to 0-3000m. Toggle with +/- keys.

Color – for depth and temperature can be changed. Toggle between available colors by means of the +/- keys.

Scale for temperature – can be set to 0 - 10°, 0 - 20°, 0 - 30°, 10 - 20° and –10 - 10°.

Interval of screen – Interval for updating of screen can be related to TIME or DISTANCE.
TIME interval can be set in 6 intervals from 5 minutes to 3 hours (+ freeze) for refreshing of the screen.
DISTANCE can be set in 7 intervals ranging from 0.05nm to 90nm in order to adjust to the boat's speed, and you can freeze the reading.

5.7 Echosounder setup

The 'Echosounder setup' display mainly consist of general settings, but also applies to a specific frequency where stated. The type of transducer selected (and installed) in the first two lines will also determine the frequencies.
The EQXX features two transceivers, a 50/200 kHz (ECHO1) and a 38/200 kHz (ECHO2), which gives the following dual frequency combinations: 38+50, 38+200 and 50+200 kHz.
One combi transducer or two single transducers can be connected.
☞ Do not connect both a combi + a second transducer at the same time – see the Installation chapter for selection of transducer.

MENU
3,8

Call up the menu bar, and…
press [3] *and* [8] *to call up the* 'Echosounder setup' display

Echosounder setup:

```
Select transducers:
                          TYPE                    PORT
 Transducer 1:      Simrad Combi C50/200          ECHO2

                       BEAM ANGLE                 DEPTH
 Transducer 1:           12/07°                  00.0 m

Keel depth below surface:                        00.0 m
Display:                              DEPTH BELOW KEEL
Data on NMEA-out from:                           200kHz
Alarm for fish:              Strength: 30dB        OFF
Depth DS fish:            min: 0010m      max: 0100 m
Depth DK alarm min.:                    0005.0 m  OFF
Depth DK alarm max.:                    0100.0 m  OFF
Water profile:                                    SALT
Velocity of sound in water:                      1470 m
Time/distance scale:                              OFF
Echo sampling:                                   BOTTOM
Demo mode:                                        OFF
MENU  Exit                                Accept  ENT
```

Use the cursor key to move cursor around in the display, and select new values by means of the +/- keys.

The ECHO1 port is for single transducers of 50/200 kHz, including speed and temperature.
The ECHO2 port is for combi transducers as well as single transducers of 38, 50 and 200 kHz, also with temperature.
Choose from the listed transducers where frequencies and other parameters are preset from the factory.

Do not connect transducers containing speed log sensor e.g. Airmar triducer B744V to ECHO2 port, as this will cause the 1kW pulses to be connected directly to the speed sensor and thereby damage the electronics beyond repair!

"Display" can show: DEPTH BELOW SURFACE, DEPTH BELOW TRANSDUCER, DEPTH BELOW KEEL.

"Data on NMEA-out from" - select the frequency you wish to use for transfer of data to connected navigator, plotter, etc.

"Alarm for fish" - set the strength from min. 00 (weak echo) to max. 99dB (strong echo), and you can set it ON or OFF.

"Depth DS fish" – define a specific area below the water surface of minimum and maximum depth for concentrated viewing.

"Depth DK alarm min. and max." – set up a depth limit alarm for depth below keel.

"Water profile" - choose between SALT and FRESH water. The setting will reflect on the:

"Velocity of sound in water": SALT = 1470 meters per second and FRESH = 1430 meters per second as standard. The standard settings can be even more accurate by slightly increasing the number of meters in warm waters and decreasing in cold waters.

"Time/distance scale" – will indicate the elapsed time or distance for the echo picture. The readout will appear in the upper part of the echo display. Toggle between time and distance in "Scroll synchronisation", section 5.8.

"Echo sampling" – is normally left at BOTTOM for total viewing all the way to the bottom, but can be changed to RANGE for a more defined search. In RANGE a new transmit pulse will be send out when the selected range has been reached. This will give a fast ping rate when searching for fish in mid water. AUTO range will switch to manual range setting. The depth alarm function has higher priority than the selected range.

"Demo mode" - the echosounder will function as though a transducer was connected, but all data presented in the displays will be simulated.

ENT *Confirm entry with* [ENT]

☞ The system will not accept an illegal combination of transducers and will block from confirming changes to the setup display before the combination is right.

5.8 Presentation setup

The most common settings for adjusting the presentation of the high or low frequency echo picture are accessed by a single keystroke.

ENT *Press* [ENT] *from active echo display*

Setup 50kHz:

Range start:	000 m
Range:	AUTO
Gain:	+30dB
White line:	OFF
Expansion window:	6 m
TVG:	Normal (20 log R)
Ping to ping filter:	ON
Signal threshold:	OFF
Color threshold:	OFF
Depth grid:	OFF
Transmit pulse length:	AUTO
Transmit power:	AUTO
Scroll synchronization:	TIME
Scroll speed:	HIGH

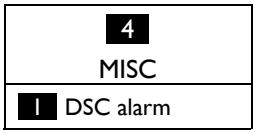
● *Go to the function you wish to change*

0-9 *Key in new figure, or…*
+/- *toggle between available values*

☞ Refer to Appendix A, for details on the functions.

ENT *Confirm entry with* [ENT] *and return to the echo display*

6. Miscellaneous menu



- see section 6.1.

6.1 DSC alarm (feature prepared for future DSC VHF)

☞ To receive a DSC Alarm and Message from VHF will require that the echosounder is connected to a compatible Simrad VHF radio-telephone.

The message from the VHF will appear in a pop-up window together with an acoustic alarm. Press [CLR] to reset the alarm.

To view the last received message:

MENU *Call up the menu bar, and…*
4,1 *press* [4] *and* [1] *to call up the message display*

7. SETUP MENU

5 SETUP	
1 Speed alarm, units & language	- see section 7.1.
2 NMEA interface	- see section 7.2.
3 Alarm output	- see section 7.3.
4 Decca lanes	- see section 7.4.
5 Loran C	- see section 7.5.
6 Display color	- see section 7.6.
7 Factory settings	- see section 7.7.

7.1 Speed alarm, units and language

MENU *Call up the menu bar, and…*
5,1 *press* [5] *and* [1] *to call up the 'Speed alarm, units & language' display*

Setup for speed:

LOG speed sensor:	ON
LOG speed calibration:	019000 PULSES/nm
Speed alarm maximum:	000.0kn OFF
Speed alarm minimum:	000.0kn OFF

Setup for units:

Depth/altitude in:	METERS
Distance in:	NAUTICAL MILES
Speed in:	KNOTS
Temperature in:	DEGREE CELCIUS

Software version:	EQ42 MKII 4.30
PAGE rotation interval:	5 sec.
Display text in:	ENGLISH GB

MENU Exit Accept ENT

To select new values for this setup display – see next page.

● *Go to the function you wish to change*

0-9 *Key in new values, or…*
+/- *toggle between available values*

ENT *Confirm entry, or…*

MENU *exit function without making any changes*

Log speed sensor – set to ON, the position display will show water speed from external log sensor (via ECHO1 port).
- with NMEA sentence VHW set to ON, the readout will show water speed from external water speed instrument (via NMEA port).

Log speed calibration: Calibrate log speed readout by increasing/decreasing the number of pulses per nautical mile – see also Appendix A.

Speed alarm: can be set to maximum and/or minimum cruising speed. This may be handy for trawl fishing, entering into harbors with speed limits, etc.

How to reset an alarm (applies to all activated alarms in the system):
CLR *Reset alarm*

Setup for units:
Depth/altitude can be set to meters (m), feet (f), or fathoms (fm).
Distances can be calculated in nautical miles (nm), kilometers (km), or statute miles (mi).
Speed can be shown in knots (kn), kilometers/hour (kh), or miles/hour (mh).

Temperature can be shown in Celsius or Fahrenheit.

Software version indicates which software version is installed in the unit.

PAGE rotation interval is default to 5 seconds, but can be altered to anywhere from 03 to 99 seconds to suit the user's need.
☞ Refer to section 2.1 for further details of the PAGE system.

Display text in: As standard the EQXX is supplied with the following display languages to choose from: Danish (DK), English (GB), French (F), German (D), Italian (I), Nederlands (NL), Spanish (E), Swedish (S) and Portuguese (P).

7.2 Interface setup, NMEA

The EQXX has two in/out ports, which can be set individually to NMEA0183. For general interfacing we recommend NMEA2, as the NMEA1 port is both an NMEA port and the port for interfacing to the dual station.

MENU
5,2 *Call up the menu bar, and…*
press [5] *and* [2] *to call up the interface setup display for NMEA*
- see example next page.

+/- *Toggle between INPUT and OUTPUT*

Go to the sentences you want to change

+/- *Toggle between available values, and between ON and OFF*

ENT *Confirm entry, and accept warning (press* [ENT] *again), or…*

MENU *exit function without making any changes*

Interface setup:			**INPUT**
Port:	NMEA1 – NMEA0183.		NMEA2 – NMEA0183
Sentence		String Status	NMEA
Water data:			
Water temperature:		**MTW OFF**	**1**
Water speed:		**VHW OFF**	**1**
Heading data:			
Heading:		**VHW ON**	**2**
Position data:			
Position:		**GLL ON**	**2**
Course:		**VTG ON**	**2**
Speed:		**VTG ON**	**2**
Navigation data:			
Navigation (APB, RMB and XTE):		**ON**	**2**
MENU **Exit**		**Accept**	ENT

NMEA input settings:

MTW	Water temperature
VHW	Water speed heading
GLL	Geographic position, latitude/longitude
RMA	Recommended minimum specific Loran C data
RMC	Recommended minimum specific GPS data
GGA	Global Positioning System fix data
VTG	Course over ground and ground speed

NMEA0183 navigation input:

APB	Autopilot sentence “B”
RMB	Recommended minimum navigation information
XTE	Cross-Track-Error, measured

NMEA0183 output sentences:

DBK	Depth below keel
DBS	Depth below surface
DBT	Depth below transducer
DPT	Depth, including offset
MTW	Water temperature
VHW	Water speed heading
WPL	Waypoint location

```
Interface setup:                                    OUTPUT
Port:                NMEA1 – NMEA0183.          NMEA2 – NMEA0183
Sentence                                  String  NMEA1   NMEA2

Water data:
 Water temperature:                       MTW       ON      ON
 Water speed and heading:                 VHW       ON      ON
 Depth below keel:                        DBK      OFF     OFF
 Depth below surface:                     DBS      OFF     OFF
 Depth below transducer:                  DBK      OFF     OFF
 Depth:                                   DPT       ON      ON

Waypoint data:
 Waypoint location:                       WPL       ON      ON

MENU  Exit                                          Accept  ENT
```

7.3 Interface setup, Alarm output (for external alarm relays)

MENU *Call up the menu bar, and…*
5,3 *press* [5] *and* [3] *to call up the interface setup display for alarm*

```
Interface setup, alarm:
  Output (pin 1,2):                                  ON
  Alarm stand-by level:                             LOW
```

Alarm stand-by level can be LOW = 0 volt, or HIGH = 5 volt.

● *Use the cursor to move around in the display*

+/- *Toggle between available values*

ENT *Confirm entry, or…*

MENU *exit function without making any changes*

7.4 Decca lanes

☞ To present a position will require that the echosounder is connected to a navigator.

MENU *Call up the menu bar, and…*
5,4 *load decca chain display*

+/- *Leaf through the available chains* – see below.

ENT *Confirm entry*

List of decca chains:

00	S Baltic	0A	24	Skagerak	10B
01	Vestlandet	0E	25	N Persian	5C
02	SW British	1B	26	S Persioan	1C
03	North Humber	2A	27	Bombay	7B
04	Holland	2E	28	Calcutta	8B
05	British	3B	29	Bangladesh	6C
06	Lofoten, Norway	3E	30	Hokkaido	9C
07	German	3F	31	Tohoku	6C
08	N Baltic	4B	32	Kyusyu	7C
09	NW Spanish	4C	33	Namaqua	4A
10	Trondelag (N)	4E	34	Cape chain	6A
11	English	5B	35	E Province	8A
12	N Bothnian	5F	36	Dampier	8E
13	S Spanish	6A	37	Port Hedld	4A
14	N Scottish	6C	38	Hokuriku	2C
15	Finland	6E	39	Newfoundld.	2C
16	Danish	7B	40	Cabot strt	6B
17	Irish	7D	41	Nova Scotia	7C
18	Finnmarken	7E	42	Salaya	2F
19	French	8B	43	Kanto	8C
20	S Bothnian	8C	44	SW Africa	9C
21	Hebridean	8E	45	Natal	10C
22	Frisian	9B	46	Shikoku	4C
23	Helgeland	9E			

7.5 Loran C

☞ To present a position will require that the echosounder is connected to a navigator.

MENU *Call up the menu bar, and…*
5,5 *load Loran C chain display*

+/- *Leaf through chain numbers* – see below.

● *If required, go to the slaves, and…*

+/- *Toggle between available slaves* (not all chains have more than one slave)

0-9 *and it is possible to alter the figures in the time delay*

● *If required, go to Offset, and key in a positive or negative offset*

0-9 *Key in a positive or negative offset to the time delay (toggle positive/ negative with +/-)*

ENT *Confirm entry*

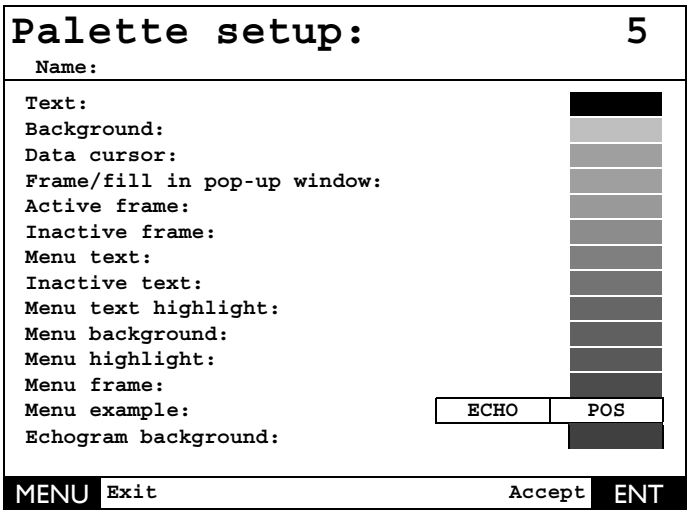
List of Loran C chains:

Central Pacific	4990	Commando Lion	5970
Gulf of Alaska	7960	North West Pacific	9970
Southeast U.S.	7980	Norwegian Sea	7970
Great Lakes	8970	Mediterranean Sea	7990
Northeast U.S.	9960	Icelandic	9980
Canadian West Coast	5990	Saudi Arabia South	7170
Canadian East Coast	5930	Saudi Arabia North	8990
Labrador Sea	7930	Eastern U.S.S.R.	7950
West Coast U.S.	9940	Western U.S.S.R.	8000
North Pacific	9990		

7.6 Display color

MENU
5,6

Call up the menu bar, and…
press [5] *and* [6] *to call up the Palette setup display*



Palette 1 to 4 are preset to bright daylight (sunshine) in 1 and 2, no. 3 to normal daylight, and no. 4 to nightlight, and they are not adjustable. Palette 5 to 9 can be customized to suit individual needs and wishes. If you wish to make your own special palette setup in e.g. Palette 5, then:

5

Select Palette 5

Go to, and…

A-Z

rename display – max. 31 characters,
- see "Alphanumeric names" next page.

Use cursor to move around in display

+/-

Toggle between available colors

ENT

Confirm new setup

Alphanumeric names:
First select the key with the desired letter, then you can either repeat the keystrokes, which will toggle between e.g. A, B, C, 1, or once you have selected one letter you can go back and forth in the alphabet by means of the +/- keys. Use the cursor key to go to next space or to go back one space if you make a mistake.
Depending on the selected language the **0** (zero) key will hold special characters e.g. Æ Ø Å Ä Ö Ü Ñ, and the **9** key will hold:
(empty space) **. -**
Press the [CLR] key to delete the character at the cursor position + everything to the right of the cursor.

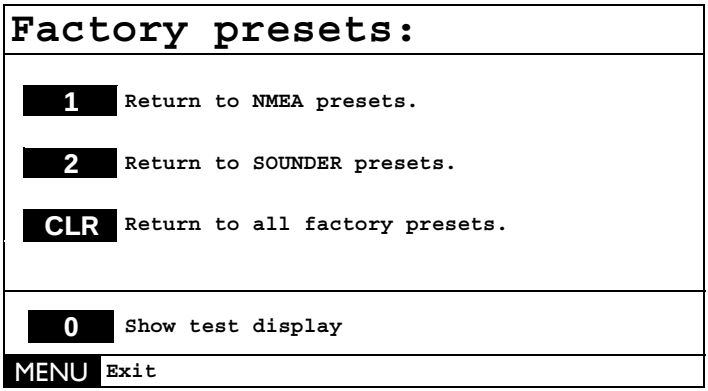
7.7 Factory settings

It will be possible to erase all sounder settings entered into the unit by the user, and return to the sounder presets set up from the factory.

If the unit is still "alive" but has ceased to respond to normal operation, it could become necessary to return to ALL factory presets – but first check "Troubleshooting" in section 9.10.

☞ Activating the "Return to all factory presets" will erase all settings including user data, and restore the basic settings from the factory.

MENU *Call up the menu bar, and…*
5,7 *press* [5] *and* [7] *to activate the 'Factory presets' display*


Factory presets:
1 Return to NMEA presets.
2 Return to SOUNDER presets.
CLR Return to all factory presets.
0 Show test display
MENU Exit

To activate one of the functions in the "Factory presets" display, please follow the instructions in the display, or exit without making any changes by pressing [MENU].

Attempting to make any type of change from this display will first of all generate a WARNING display that you are about to7 erase some or all data/settings.
If you are absolutely sure, press [ENT] to complete the job.
If not absolutely sure, then press [MENU] to exit the function.

Power off - Reset
In case, for some reason, the unit is totally locked i.e. no immediate response from the keypad, then first try to reset the unit by disconnecting the power supply. Reconnect the power cable and then start up the unit again by pressing and holding the [PWR] key until a picture appears on the screen.

Master reset (will return all settings to factory presets)
If the Power off - reset does not solve the problem, you may have to perform a **master reset** by disconnecting the power supply, and then while reconnecting the power cable you need to press the [PWR] + [CLR] keys at the same time, and hold both keys depressed until a picture appears on the screen.

Show test display
Information in this display is for technicians only.

8.1 Parts of an echosounder

An echosounder is composed of a display screen, processor, and receiver/ transmitter unit which in the case of the EQXX, are housed in one unit. Connected to this unit by a shielded cable is the transducer which is mounted horizontally on the bottom of the hull or on the transom.

8.1.1 Display screen

The display screen presents in graphic and numerical form the information the processor is receiving and accumulating from the transducer.

8.1.2 Processor

The processor is the "brain" of the echosounder. It is sealed inside the unit which protects it from harm. The processor is composed of highly sophisticated micro-processor, memory and logic circuitry.

8.1.3 Receiver/transmitter

The receiver/transmitter (often called the "transceiver") section of your echo-sounder takes it's commands from the processor. The processor tells the trans-ceiver to activate the transmitter. The transmitter sends a high voltage transmit "ping" to the transducer mounted on the hull. At that point the transmitter's job is done and the receiver takes over. See Figure 1.

The receiver is also connected to the transducer and amplifies the very small signals received as echoes from fish and the sea floor which arrive at the trans-ducer (see Figure 2). The receiver is designed to reject other signals as much as possible and to provide enough amplification to see even relatively small targets at long ranges.

The amplified receiver signals are then send to the processor to be shown on the display screen.

8.1.4 Transducer

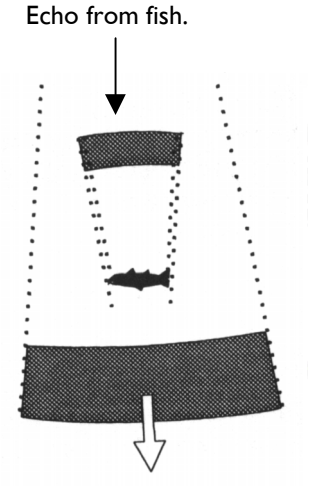
A transducer can be single or multiple ceramic elements in a rugged housing made from reinforced plastic, bronze or stainless steel.
The transducer is attached horizontally to the bottom of the hull. It is essential that the transducer be mounted properly (see chapter 9. Installation and service),

as echo transmissions are radiated at right angles from the transducer face. Shielded cables connect the transducer with the echosounder.

8.2 How the EQ42/50/52 MKII works

When the EQXX is turned on, the processor begins to send electrical pulses to the transducer. The ceramic resonators in the transducer has a special property which enables it to change dimensions slightly when a varying voltage is applied.
The voltage is thus converted to mechanical vibrations (sound waves) which are then transmitted down through the water.
See Fig. 1.

Fig. 1 – Transmitted 'ping' from the receiver/transmitter.



The sound waves move through the water until they encounter a change in density, such as a fish or the bottom. This causes the sound waves to "echo" back up through the water. When the reflected sound waves (echoes) hit the transducer, the ceramic disk vibrates at the same frequency.
This generates a varying voltage between the disk surfaces. This voltage goes back up through the cable to the receiver.
The EQXX processes the signals and presents them on the display screen.
See Fig. 2.

Fig. 2 – Echo returning to the receiver.

8.2.1 Transducer beamwidth

The transducer mounted to the hull of your vessel serves as both a "speaker" when transmitting, and as a "microphone" when the echosounder is receiving. Similar to the way a flashlight focuses light, most of the sound from your transducer is focused downwards with a smaller amount going out to the sides. The amount of focusing of the sound beam is expressed as a "beamwidth".

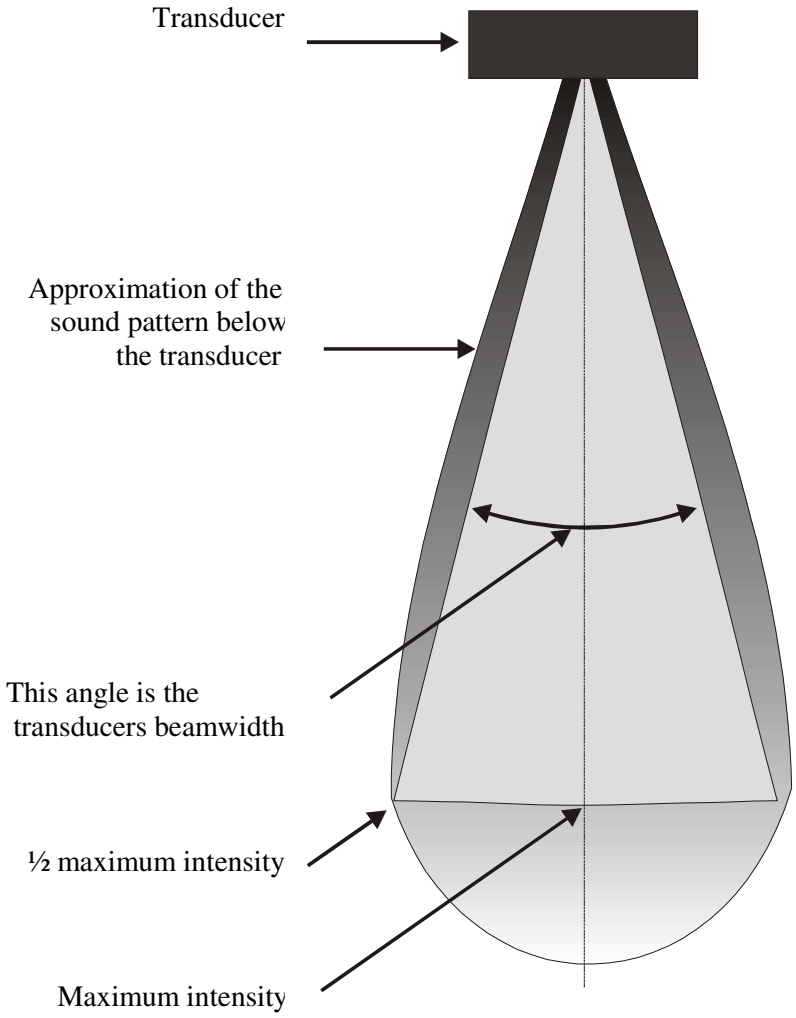

Transducer
Approximation of the sound pattern below the transducer
This angle is the transducers beamwidth
½ maximum intensity
Maximum intensity

Figure 3 – A representation of a transducer beamwidth <File: trdbeam.cdr>

The center of the sound beam is the most intense, then as you move out towards the sides of the sound beam there is a point where the intensity of the sound is half what it was in the center. The distance moved is the “beamwidth”.
See Figure 3.

8.2.2 Effects of the vessel’s speed

The display of fish on the EQXX depends directly on the vessel’s speed, as well as on the depth of the fish. When the vessel is at rest, the echo traces will appear stretched and flattened. As the vessel’s speed becomes greater, the echo traces will become shorter and more arched. The reason for this change in appearance is that as the vessel speed increases fewer number of sound “pings” strike each fish. A low vessel speed will provide the most accurate information of where fish are located.

9. Installation notes

For a number of reasons, all user-related decisions, setups, etc. should be noted in these two pages as they occur. This information may be helpful if your unit has been updated with new software, reset or in for service.

Transducer connections:	
Port	**Transducer**
ECHO1	
ECHO2	

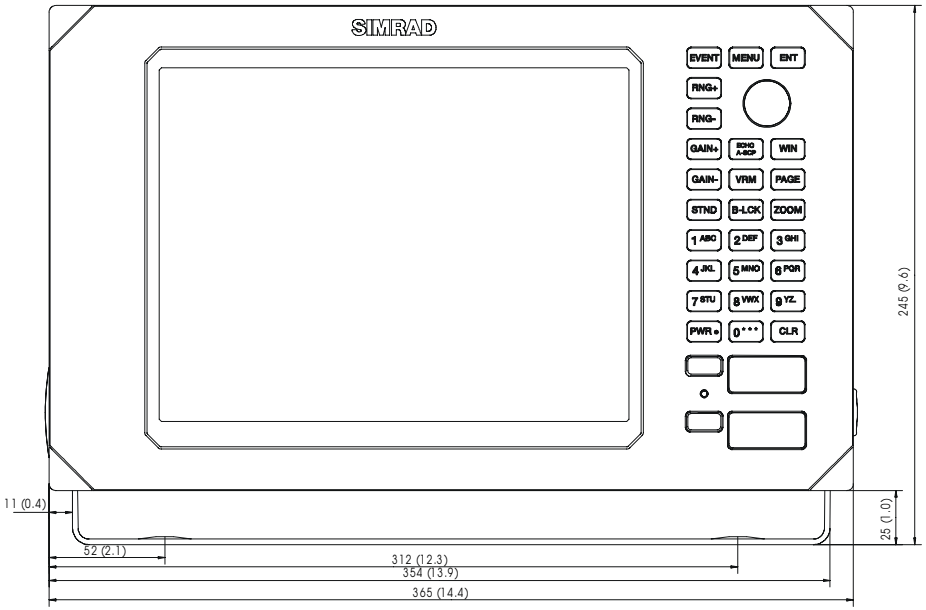
Echo setup:		
Transducer	**Port**	**Transducer frequency and type**
1	**ECHO**	
2	**ECHO**	

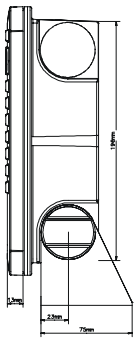
Other important settings:		

Other important settings (continued):		

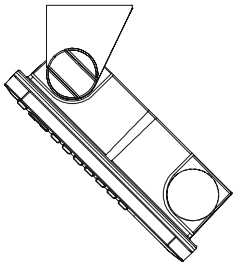
9.1 Installation of EQ42 Echosounder

The EQ42 can be flat or bracket mounted – overhead, bulkhead or console.

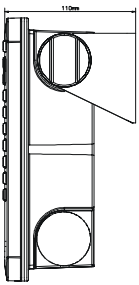




Console

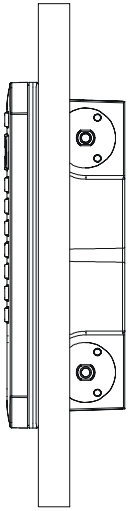


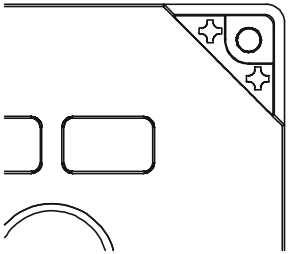
Overhead



Bulkhead

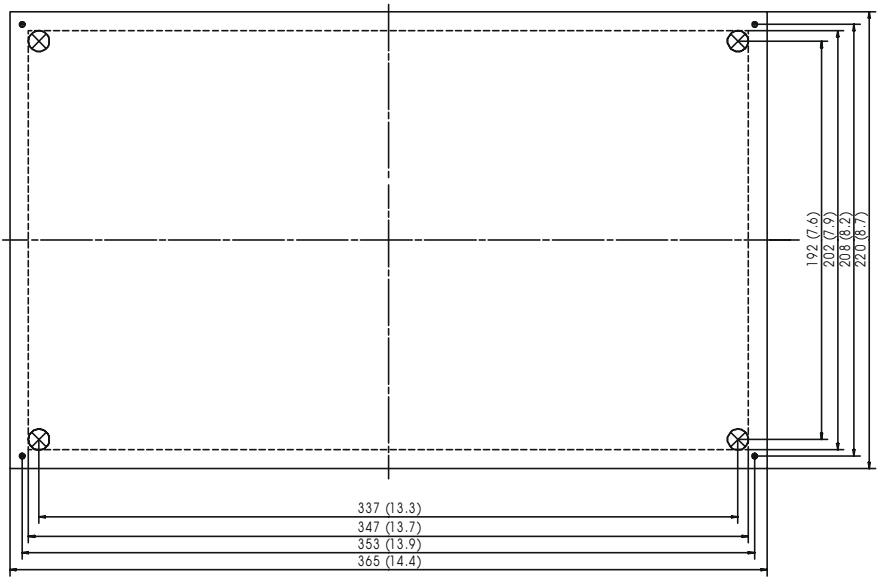
Flush mounted EQ42:





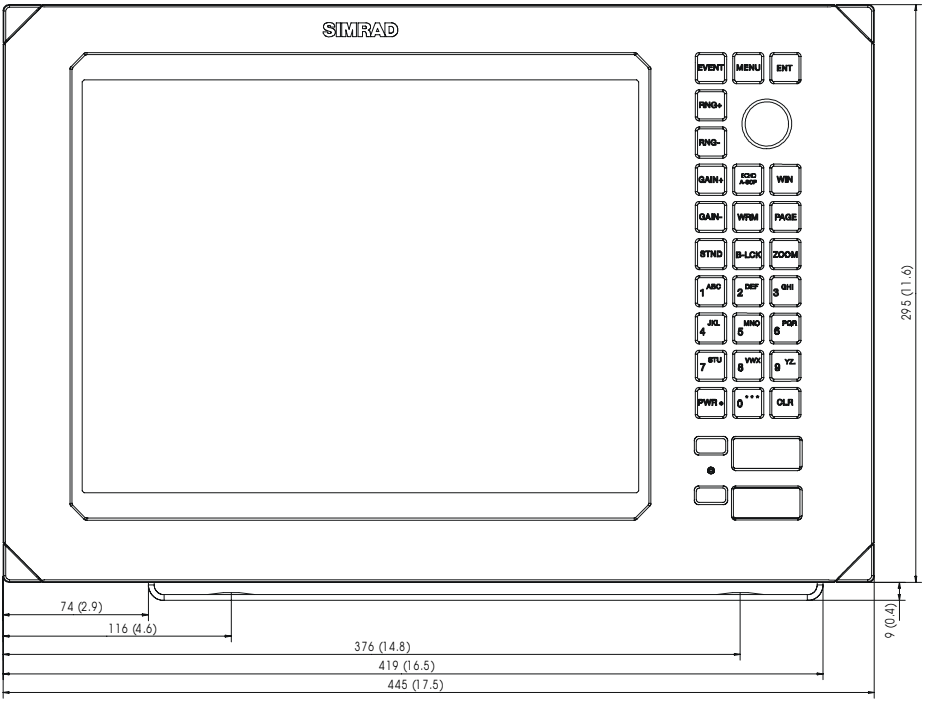
Removable corners, example.

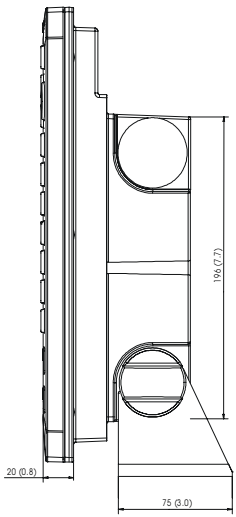
See template for instructions:



9.2 Installation of EQ50 Echosounder

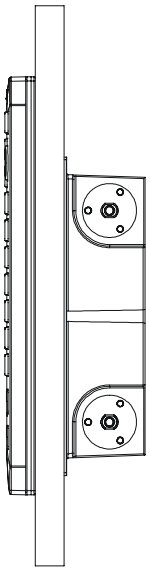
The EQ50 can be flat or bracket mounted – overhead*, bulkhead* or console.



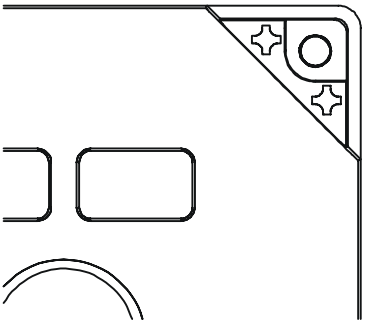


* Overhead and bulkhead mounting is only possible if using a distance piece.

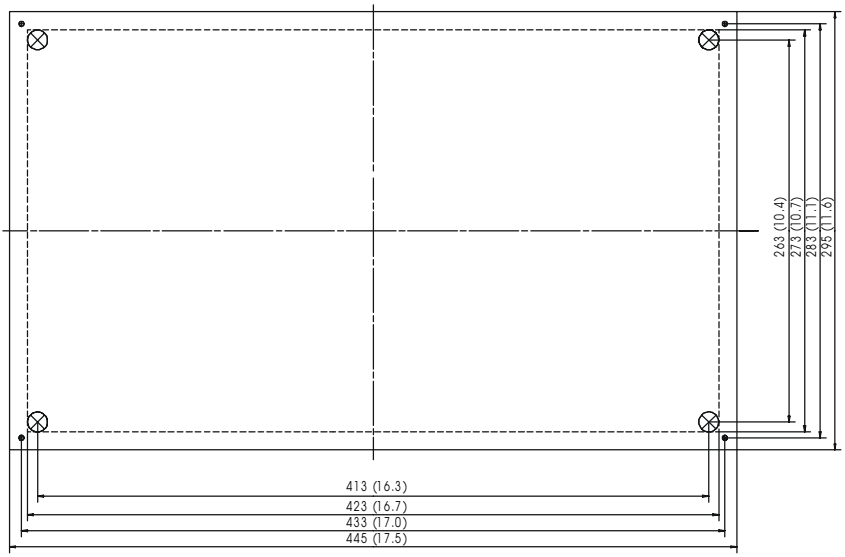
Flush mounted EQ50:



Removable corners, example:

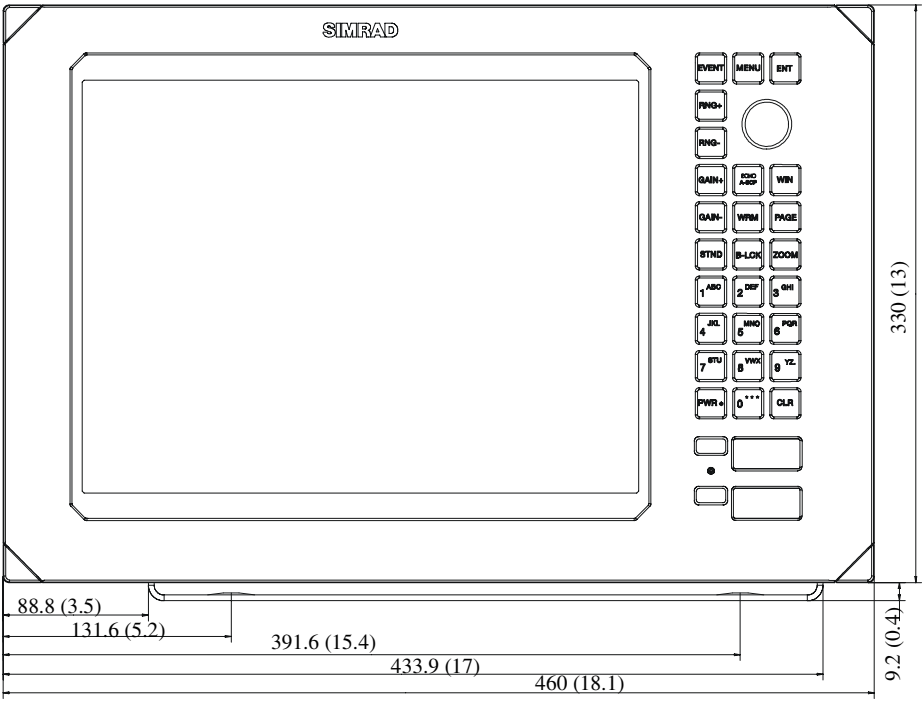


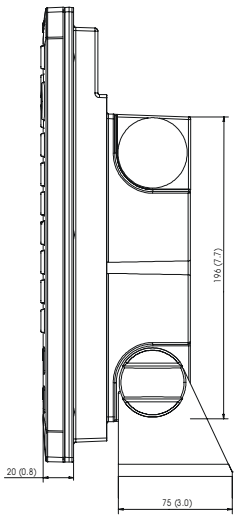
See template for instructions:



9.3 Installation of EQ52 Echosounder

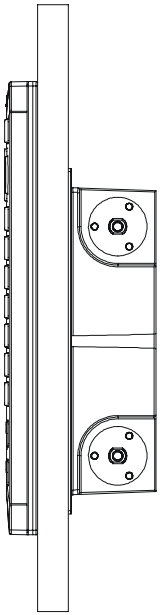
The EQ52 can be flat or bracket mounted – overhead*, bulkhead* or console.



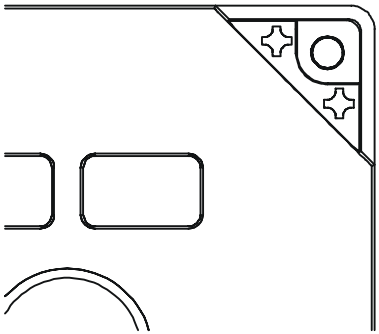


* Overhead and bulkhead mounting is only possible if using a distance piece.

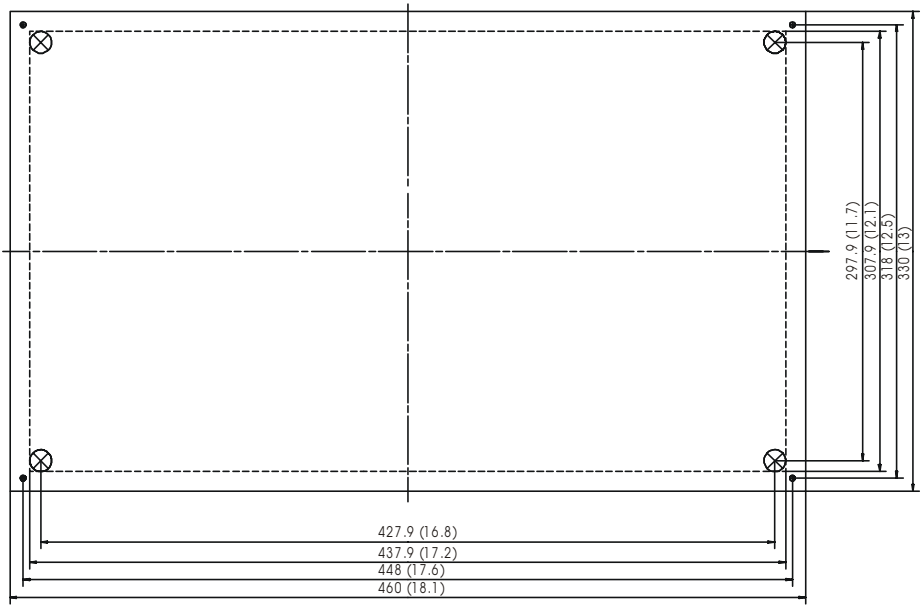
Flush mounted EQ52:



Removable corners, example:



See template for instructions:



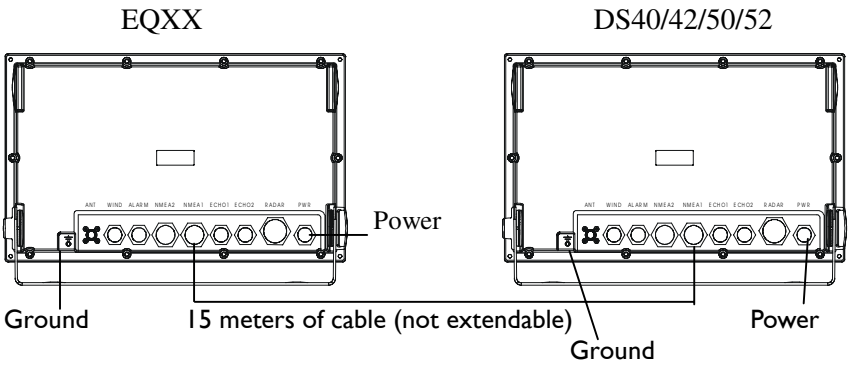
9.4 Place of installation of display unit

The display unit can be installed on desktop, wall surface, or ceiling. Determine the place to install the display unit that is convenient for navigation and general operation after considering the following suggestions:

- a place where you can see the ship's bow when you raise your eyes from the display.
- a place where there is limited exposure to direct sunlight – see environment temperature limits in 9.11 Specifications.
- a place where there is good ventilation and minimum vibration.
- a place where the minimum distance to a magnetic compass is 500mm (20").

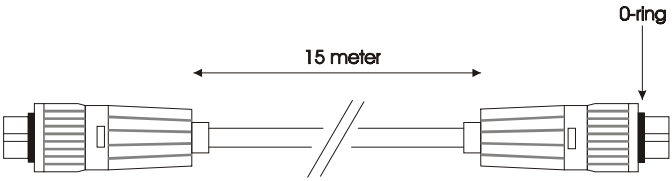
9.5 Installation of Dual Station DS40/42/50/52

The DS models are remote control units for the EQXX Echosounder.
The units with the same model numbers are identical in size e.g. DS42 and EQ42, so the same installation guides can be used when performing the installation. When choosing a dual station, the unit does not have to match the main unit in size, as all the mentioned units are compatible.

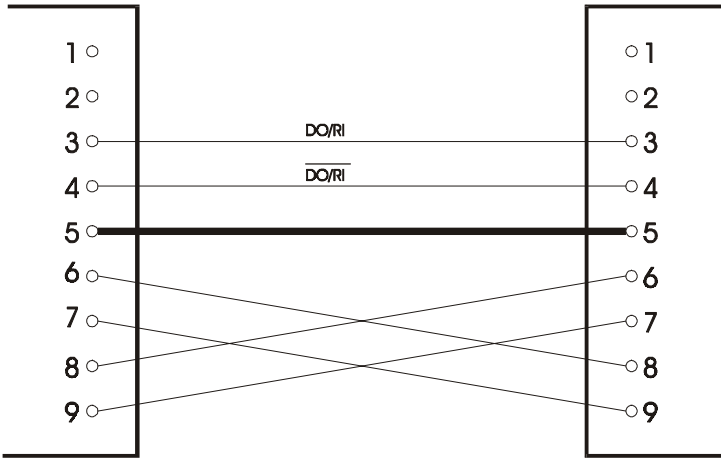


A special connection cable of 15 meters with two male plugs is supplied with the dual station. Push one of the male plugs into the socket marked NMEA1 on the back of the main unit and the second into the dual station. The NMEA1 interface from the main unit is transferred to the dual station via the connection cable and is available on the dual station's NMEA2 receptacle.

☞ Refer to section 9.6 for details on pin numbers.



The connection cable between the dual station and the main unit is a special pair-twisted cable of 15 meters (not extendable), which consists of the following wires:



104.3002.023

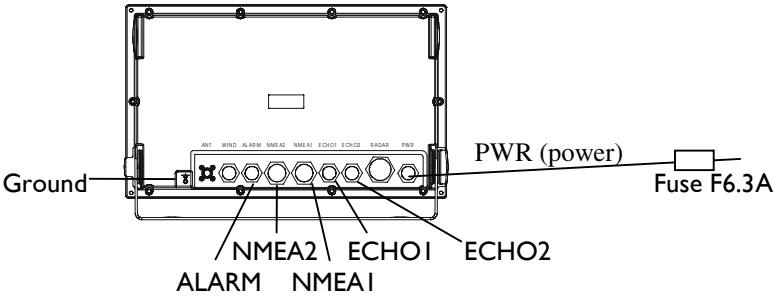
9.5.1 Operation of DS40/42/50/52 remote control

The main unit and the dual station operate in parallel. All key commands on the dual station are relayed to the main unit – EQXX – and the display picture is instantly transferred back via a high speed data link.

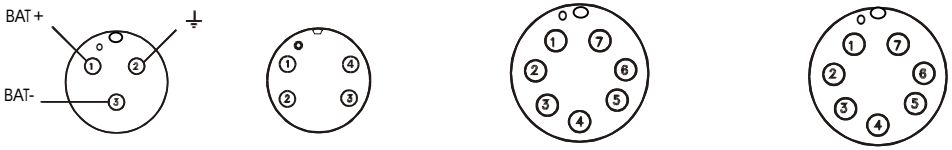
Adjust light/contrast in screen and background light in keypad via the [PWR] key.

9.6 Electrical connections (connectors, seen from solder side)

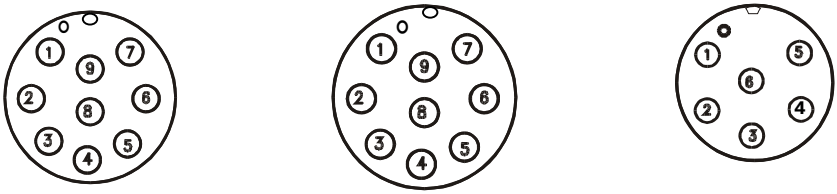
The PWR receptacle will accommodate either 3 or 4 (2) pin connectors, depending on model and version.



PWR (male mini-con-x)		ECHO2 (male mini-con-x)	ECHO1 (male mini-con-x)
1: + 10-32 Vdc, red	1: NC	1: Depth I+	1: Speed log
3: - Battery, black	2: NC	2: Depth I-	2: 5V supply speed log
2: Earth	3: - Battery, black	3: Depth II+	3: Depth 1+
	4: + 10-32 Vdc, red	4: Shield	4: Shield
		5: Depth II-	5: Depth 1-
		6: GND (Temp.)	6: GND (Temp./Speed log)
		7: Temp.	7: Temp.



NMEA2 (male multi-con-x)	NMEA1 (female multi-con-x)	ALARM (male mini-con-x)
1: RTS (TL50)	1: + 10-32 V out (Dual Station)	1: RELAY A, white
2: DTR (TL50)	2: - Battery out (Dual Station)	2: RELAY B, brown
3: RXD (TL50)	3: DO / RI (Dual Station)	3: NC, yellow
4: TXD (TL50)	4: DO / RI (Dual Station)	4: NC, green
5: GND	5: GND	5: NC, grey
6: NMEA2 TX A (DATA OUT)	6: NMEA1 TX A (DATA OUT)	6: GND, pink
7: NMEA2 TX B (RETURN)	7: NMEA1 TX B (RETURN)	
8: NMEA2 RX A (DATA IN)	8: NMEA1 RX A (DATA IN)	
9: NMEA2 RX B (RETURN)	9: NMEA1 RX B (RETURN)	



9.6.1 Power supply connections

The internal voltage regulator will allow the EQXX to operate normally over the power supply voltage range from 10 to 32 V dc. Connections between the EQXX and the external power supply are accomplished by means of the supplied power cable, which is approximately 1.5 meters long.

After connecting the cable to the power source, push the plug as far as it will go into the two pin receptacle marked "PWR" on the rear of the cabinet and turn the plug's coupling ring clockwise until it clicks into locked position.

9.6.2 Fuse

Warning! Using a fuse which is not specified for your equipment can cause it to blow the instant the EQXX has been switched on or it will not protect the equipment in the event of trouble. Refer to 9.11 Specifications.

9.6.3 Transducer connection

Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – EQXX. Push the female plug, as far as it goes, into the receptacle marked "ECHO1" or/and "ECHO2" on the rear of the cabinet and turn the plug's coupling ring clockwise until it clicks into locked position

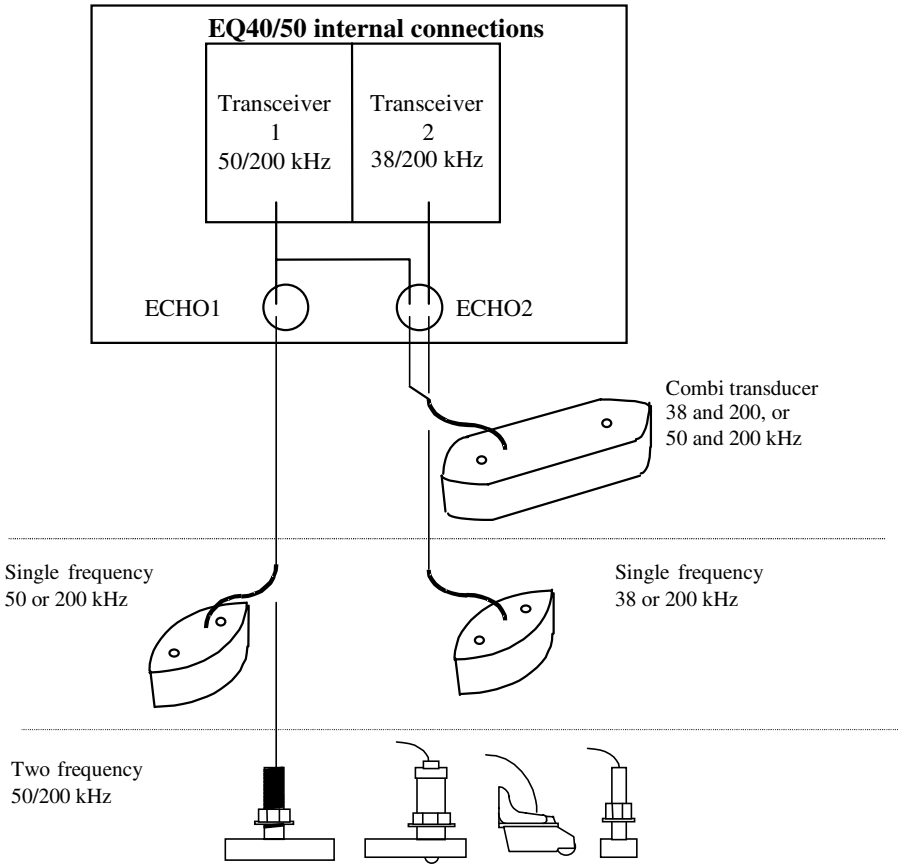
☞ *The EQXX must be turned off while connecting/disconnecting the transducer cables.*

Recommended connection and setup of Simrad supplied transducers:

Transducer type	Port	Echosounder setup
Simrad 50/200 C	ECHO2	Simrad Combi C50/200
Simrad 38/200 C	ECHO2	Simrad Combi C38/200
Airmar B250	ECHO2	Airmar Combi B250-22
Airmar B260	ECHO2	Airmar Combi B250-22
Airmar P319, P52, P66, B117, B45, SS505, B744V, SS544V, B256	ECHO1	200kHz Airmar Des. A 50kHz Airmar Des. A
Airmar ST650	ECHO1	

☞ See transducer connections next page, and Echosounder setup, section 5.7.

Transducer connections:


EQ40/50 internal connections
Transceiver 1 50/200 kHz
Transceiver 2 38/200 kHz
ECHO1
ECHO2
Combi transducer 38 and 200, or 50 and 200 kHz
Single frequency 50 or 200 kHz
Single frequency 38 or 200 kHz
Two frequency 50/200 kHz

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⚠ Warning!

Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port “ECHO2”. To avoid accidental connection, “ECHO2” is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

9.6.4 NMEA0183 interface connections

NMEA0183 interface connections are made to the receptacle marked "NMEA1" or NMEA2" on the rear of the cabinet – turn the plug's coupling ring clockwise until it stops.
☞ *The EQXX must be turned off while connecting/disconnecting the interface cables.*

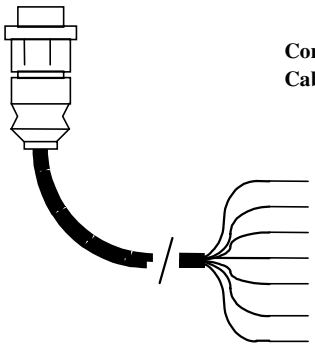
9.6.5 Optional connections

EQXX, port NMEA1 and NMEA2

Pin 6	White	TX A (DATA OUT)
Pin 7	Brown	TX B (RETURN)
Pin 8	Yellow	RX A (DATA IN)
Pin 9	Green	RX B (RETURN)

9.6.6 Universal connection cable for unspecified transducers

Transducers are recommended to be 60 to 80 ohms and minimum 1kW. The universal connection cable should be applied for connecting one or two transducers to either ECHO1 or ECHO2 port.



Connection cable
Cable type AMW STYLE 2464

Pin	**ECHO 1**	**ECHO 2**
1 Red	Speed log	Depth 1+
2 Black(brown)	VCC speed	Depth 1-
3 Blue	Depth 1+	Depth 2+
4 Shield	Shield	Shield
5 White(orange)	Depth 1-	Depth 2-
6 Green	Gnd.*	Gnd. (Temp.)
7 Yellow	Temp.	Temp.

*) Temp./speed log

9.7 Basic transducer and cable information

For optimum performance of the EQXX Echosounder, the Simrad combi transducers C38/200 and C50/200 are recommended. These transducers also include a water temperature sensor. A variety of alternative medium-range transducers is available for vessels mainly operating in shallow waters and/or where the size of the transducer is critical.

The installation should be carefully planned in advance, keeping in mind the standard cable length of 10 meters (32 feet) which is connected to the transducer. In the event where the standard cable is not long enough, up to an additional 10 meters (32 feet) may be connected without affecting the performance of the system. The cable must be of the same type as the standard cable.
☞ The EQXX must be turned off while connecting/disconnecting the transducer cable.

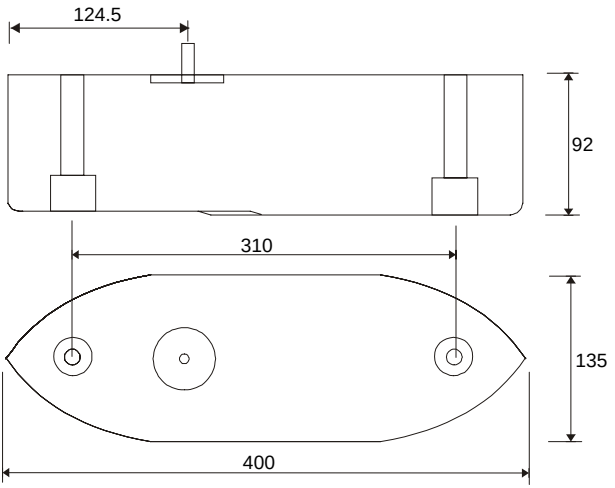
The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent shielding is maintained, that cable of adequate cross section is used, and that all connections are properly made and protected from the effects of the marine environment.
If possible, running the transducer cable through a grounded conduit will greatly decrease the likelihood of interference. Likewise, the EQXX transducer cable should be run as far as possible from other electrical cabling. If it is absolutely necessary to pass close to other cabling, it is best to keep as much distance as possible, and to make all crossings as close to a right angle as possible.

The 1kW output signal from the echosounder is automatically reduced due to the difference of impedance in the transmitter, which is 75 ohms, and the transducer, which is 185 to 425 ohms. See section 5.7 Echosounder setup for correct setting for the transducer selected.
The EQXX's transmitter is designed to match Simrad 1kW 75 ohms high performance transducers described in section 9.7.1 Transducers.

⚠ Warning!
Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port "ECHO2". To avoid accidental connection, "ECHO2" is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

9.7.1 Transducers (optional)

Simrad Combi-transducers C50/200 or C38/200



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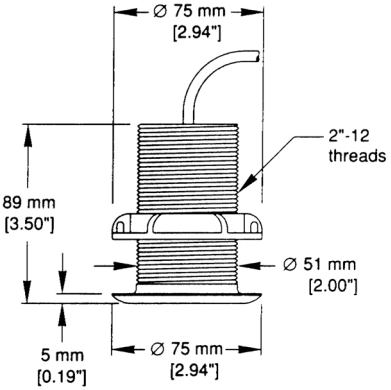
Combi C50/200 or C38/200 combines two transducers and a temperature sensor in one housing. It has a streamlined shape, designed for mounting onto the hull.

Frequency:	**50 and 200 kHz**	**38 and 200 kHz**
Beamwidth:	longitudinal 10° / 7° transverse 16° / 7°	longitudinal 13°/ 7° transverse 21° / 7°
Maximum pulse power input:	1000 W	1000 W
Maximum continuous power input:	10 W	10 W
Storage temperature:	max.70°C, min. –20°C	max.70°C, min.–20°C
Cable length:	10m (32’)	10m (32’)
Maximum transducer depth:	20 meters	20 meters
	Reference No. 700.3000	Reference No. 700.3001

Airmar P319



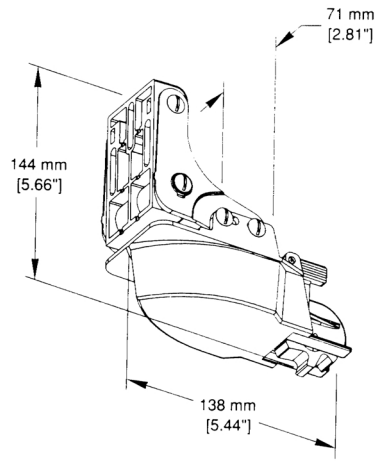
Thru-hull mount

(not for use in wood hulls)
Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32')
Depth information.

Reference No.179.0401.002 (P319)
Housing: reinforced plastic

Reference No.179.0401.003 (B117)
Housing: bronze

Airmar P52



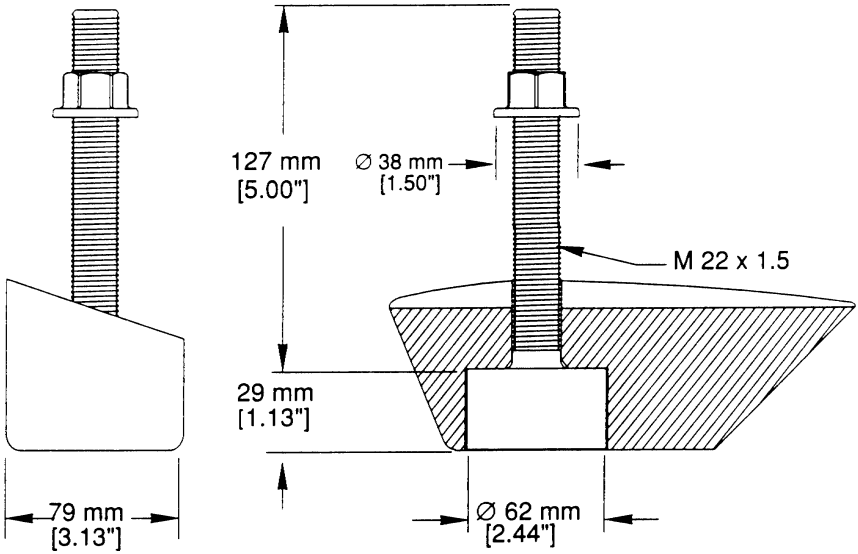
Transom mount

(for fiberglass, aluminum, wood, or inflatable hulls)
Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32')
Speed, temperature + depth information.

Reference No. 179.0401.001
Housing: chemical resistant, high impact plastic alloy.

☞ Do not connect to ECHO2 port!

Airmar SS505



Thru-hull stem mount
Accommodates hull thickness:
Min. no fairing 6 mm (1/4")
Max. with fairing 83 mm (3 ¼")

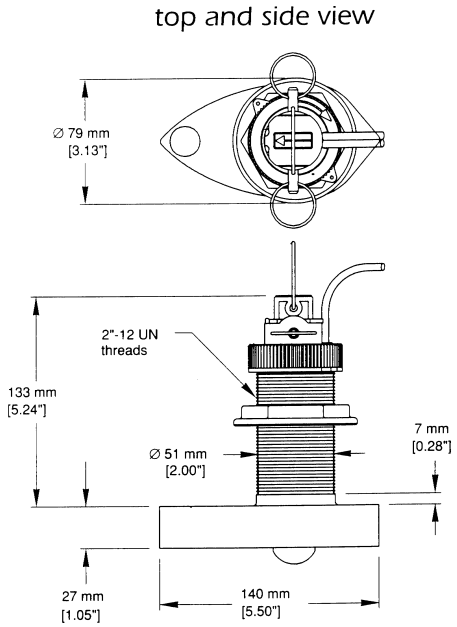
Ref. No. 179.0401.011
Optional fairing.

Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32')
Depth information.

Ref. No.179.0401.004 (B45)
Housing: bronze
(fiberglass or wood hulls only)

Ref. No.179.0401.008 (SS505)
Housing: stainless steel
(compatible with any hull material)

Airmar B744V



Thru-hull triducer
Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32')
Speed, temperature + depth information.

Ref. No.179.0401.009
(B744V)
Housing: bronze

☞ Do not connect to ECHO2 port.

9.7.2 Determining the position for the transducers

The EQXX is a sophisticated piece of electronic equipment, but how well it will perform under actual operating conditions will be largely dependent upon the location of the transducer and how it has been installed.
Careful consideration, therefore, must be given to selecting the mounting location and on deciding the method of installation that best suits the vessel.

Air bubbles and turbulence caused by the vessel's movement through the water will seriously degrade the transducer's performance. Therefore the transducer should be located well clear of any water intake or discharge line and also clear of any projection along the hull line which might disturb the smooth flow of water.

It is of profound importance for good performance of the EQXX that the water flowing over the transducer be free of bubbles and aeration. If the transducer face is clean but the performance degrades with increasing vessel speed, then aeration of the water flowing under the transducer may be the cause of the poor performance.

Due to the varying design of ship's hulls and different operating speeds, there can be great variation in the amount of air bubbles which are carried beneath the hull. These bubbles tend to be carried close to the hull as they pass aft. For this reason, it is desirable for the transducer to be mounted on a fairing block which holds the transducer away from the hull and which directs the flow of aerated water around the sides of the transducer rather than over the face of the transducer.

On deep keeled vessels, care must be taken to ensure that the transducer beam will not be blocked by any part of the keel. Although the appropriate mounting location that meets all requirements depends on the type of vessel and its normal operating speeds, a practical choice is usually somewhere between one third and one half of the vessel's water line length from the bow. Leveling blocks may be designed accordingly to meet this requirement.

☞ The more the transducer protrudes from the hull, the better the results will be.

Particularly the lower frequency operation, interference from propeller noise can be a significant problem. This can be seen as an increase in the "noise" on the echosounder display when the propeller speed is increased. To help reduce this, the transducer" mounting face may be angled slightly forward on the order of 5° for the 50 kHz transducers and 3° for the 200 kHz transducers. The goal is to incline the transducer so that a line of sight along the transducer's radiating surface passes below the propeller.

☞ Keeping the propeller clean and free of any nicks or roughness will assist in minimizing interference from propeller noise due to cavitation.

Sources of noise to consider:

Water/air noise	Acoustic noise	Electrical noise
Air bubbles Turbulence Propeller	Main engine Reduction gear propeller shaft Generators auxiliary engines Power plant for freezers Hydraulic pumps Rudder engine Bow thruster Stern thruster	Noise from electrical cables Noise from generators Poor grounding of instrument Radiated noise from other instruments Dc – Dc converters Electrical winches Neon lights etc.

9.8 Preventive maintenance

Surface cleaning – to keep the EQXX cabinet and display screen clean, wipe the surfaces with a clean damp cloth. For heavier cleaning, use a clean, damp cloth which has been dipped in a solution of a mild dish detergent and water. Wring out firmly before wiping the unit.

Electrical connections – periodically check the electrical connections. Make sure that connections are tight and that no cables are frayed or worn.

Transducer – periodically clean the face of the transducer with a plastic utensil using a scrubbing action.
☞ Do not use a harsh abrasive or a solvent to clean the transducer.

9.9 Repair and service

The EQXX is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the EQXX requires servicing or repair, call your authorized SIMRAD dealer, but first check section 9.10 Troubleshooting.

Spare parts – fuses may be bought from a chandlery or a marine supply store. If you require a SIMRAD part, please contact your authorized dealer.

9.10 Troubleshooting

For all fault finding, first check that the supply voltage is between 10 – 32 V dc.

Symptom	Check	Remedy
No picture on display screen.	Check that the unit is turned on.	Press [PWR] key on keypad.
	Check fuse in EQXX power cable.	Replace fuse. Use only type 6A3F.
Picture appears on the display screen, but image is too dark or too bright.		Adjust the image as desired by pressing the [PWR] key, adjust light/contrast, and press the [ENT] key.
Picture appears normal, but no targets are shown or only random "noise" is seen	Check that the correct transducer is selected	Go to Echosounder setup and select transducer type
	Check that the transducer connectors have been wired properly.	If not properly wired, rewire the connectors.
	Check that the transducer connectors are securely mated with the console.	Correctly mate the connectors to the console.
	Check that the receiver gain is set high enough.	Increase the receiver gain. See Chapter 5.8 Presentation setup.
	Check that the range is correct for the water depth.	Adjust the range. See Chapter 5.8 Presentation setup.
	Check that the Demo mode is not active.	Go to "Echosounder setup" in Echosounder menu and set Demo mode to OFF.
Excessive noise in echo picture	Check for correct grounding	Connected equipment should be properly grounded between it and the echosounder.
No normal picture.		Turn unit off and on again.
No response to key operation.		Disconnect power and connect again.
No normal picture or key operation.		Return to factory presets, refer to section 7.7.
All data is deleted after turning the unit off and on.	Check battery lifetime, which is 3-5 years.	Internal battery must be replaced by authorized dealer

9.10 Specifications of the EQ42/50/52

General data

Power supply: 12 & 24 Vdc (max.10-32 Vdc) 25 Watts.
Dimensions: - EQ42: H:220 (8.8") x L:365 (14.6") x D:75 (3") mm.
- EQ50: H:300 (12") x L: 445 (17.8") x D: 90 (3.6") mm.
- EQ52: H:330 (13") x L: 460 (18.1") x D: 95 (3.7") mm.
Environment: 0 to +50°C, waterproof USC 46 CFR and IP55.
Housing: Casted aluminum back, polycarbonate front.
Weight: EQ42: 3.7 kg (7.4 lbs.), EQ50/52: 5.3 kg (10.6 lbs.).
Display: TFT/ATFT color, power backlight, 640x480 pixels,
EQ42 = 10.4 in., EQ50 = 13.8 in., EQ52 = 15 in.
Presentation: 4 pages (screen layers), each with several window combinations.
Manual operation or automatic rotation of the 4 pages.
Interfacing: 2 ports in/out NMEA 0183, dual station.
Alarm output: Alarm relay (contact closure).
Fuse: F6.3A.

Echosounder section

Frequencies: 38, 50 and 200 kHz, selectable.
Output power: Variable up to 1kW RMS per channel.
Impedance: 75 ohms
Display ranges: 3 to 3000 meters in 21 steps, and auto.
Detection ranges:

Frequency	Beam	Fish*	Bottom*
38 kHz	13x21°	410m	1800m
50 kHz	10x16°	430m	1500m
200 kHz	7°	290m	550m

*Single Fish Target Strength: -30dB (60cm cod)
*Bottom Back Scattering Strength: -20dB
*Simrad transducer C38/200 or C50/200

Pulse length: Short, medium, long and auto.
Max. transmission rate: 10 pings per second.
Alarms: Fish, max. and min. depth.
Zoom mode: Bottom and VRM expansion = 3 to 50 meters, feet or fathoms.
Event markers: At current echo (ping) and depth memory.
Picture speed: True distance or time (3 steps), 1 step/ping and freeze.

Noise filter: User-selectable on/off.
Echo presentation: A-scope and white line discrimination.
Temperature: Transducer or NMEA.
Speed: Transducer or NMEA.

Dual frequency transducers
Simrad C38/200, 1kW high performance combi transducer 38 and 200kHz, 13x21° and 7° beams.
Simrad C50/200, 1kW high performance combi transducer 50 and 200kHz, 10x16° and 7° beams.
Airmar B250-22, 1kW combi transducer 50 and 200kHz, 19° and 6° beams.

Alternative 50/200kHz medium-range transducers (Airmar Des.A)
B256, 1kW medium range transducer 16x28° and 4x6° beams.
B45, 600W Bronze stem mount transducer 45° and 15° beam.
B744V, 600W Bronze through hull triducer, depth, speed and temperature, 45° and 15° beam.
P52, 600W plastic transom mount triducer, depth, speed and temperature, 45° and 15° beam.
P319, 600W plastic through hull transducer 45° and 15° beam.

ST650, Speed and temperature only.

Options
Universal connection cable, type AMW STYLE 2464.
DS42 Dual Station, 10” ATFT color LCD screen.
DS50 Dual Station, 14” TFT color LCD screen.
DS52 Dual Station, 15” TFT color LCD screen.
Sunhood.

Glossary of terms

Alarms – can be set to sound a "beep" if the echosounder detects a target above (shallower than) a minimum alarm depth or below (deeper than) a maximum alarm depth. The EQXX allows you to set the alarm depths and to enable or disable both the minimum and maximum depth alarms.

A-Scope – a method of displaying the echosounder information. In A-Scope mode, the echoes are displayed in a "bar-graph" format, with stronger echoes displayed not only in the color representing their target strength, but also in a width representing their target strength.

Color threshold – the color threshold function allows the "weaker" targets and noise which may be shown on the display screen to be eliminated from the display. These targets are usually shown in the weaker target colors such as blues and greens. The Color threshold allows you to choose not to display the blues, or the blues and greens, etc. Doing this will leave only the stronger targets on the display screen.
☞ The monochrome version dual station will have 3 different tones of gray.

Configuration – the configuration functions of the EQXX allow you to adapt the system more specifically to your needs. You may set Units of measure (feet, fathoms, meters, etc.), Background color, Menu language, Scroll speed, etc.

Depths – DK = Depth below keel, DS = Depth below surface, DT = Depth below transducer.

Echogram background color – is the color shown on the EQXX in the event no target is present. There are three colors to choose from: white, blue or black, where black is especially useful during nighttime operation.

Echosounder frequency – 38 kHz, 50 kHz or 200 kHz can be selected to suit the task. 200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam. 38 kHz and 50 kHz are for searching in a wider area, determining bottom conditions and going the deepest.

Event marker – pressing the [EVENT] key will set a vertical marker on the screen at the current echo (ping) to indicate a school of fish, etc. The echo-sounder can send out WPL via NMEA for automatic plotting of the event-

marker as a waypoint in connected chartplotter, capable of receiving WPL.
☞ The EQXX must be receiving position data. Refer to Interface setup in section 7.2.

Expansion (zoom) – this function allows you to take a closer look at a particular section of the water underneath your boat. You can expand the view near the bottom (Bottom expansion) or near the Variable Range Marker (VRM expansion). The amount of expansion can be adjusted in "Expansion window", section 5.8 Presentation setup.

Gain – is another way of saying "sensitivity", or possibly "volume". Increasing the gain setting of the EQXX will allow you to see smaller and deeper targets. If the gain is set too high, however, you will begin to see "noise" and unwanted targets. Generally speaking, you want to set the gain control just below the point where you begin to see speckles of "noise" between the surface and the bottom on the screen. Settings can be entered from –99.9 to +99.9.

LOG speed calibration – the unit is preset to receive 19000 pulses per nautical mile from the log transducer (paddle wheel). However the figure might have to be changed to compensate for various transducers and actual waterflow passing the transducer. The correct pulse rate is calculated by:

$$\frac{\text{19000 x indicated speed (e.g. 4kn)}}{\text{actual speed (GPS) (e.g. 5kn)}} = 15.200 \text{ pulses/nm}$$

Measurement units – refers to the measurement unit used in the range display. The user may select the displayed units to be one of the following: meters, feet or fathoms.

MENU – the selection of main menus will be shown in the upper part of the screen. Leaf through the menus by means of the cursor key and select the high-lighted menu by pressing the [ENT] key, or use the numerical keys to activate one of the menus.

NMEA – National Marine Electronics Association. The NMEA is an organization of manufacturers and dealers of marine electronics equipment. They have adopted the NMEA0183 as a standard for communications between various types of marine electronic equipment.

Ping to ping filter – can be set to either on or off. With the filter "off", then each received echo will be reflected on the screen. Whereas with the filter "ON", the system will compare every two echoes received and only reflect on the screen what is received from both echoes, which will give a more uncluttered and precise presentation.

Pulse length – the transmitted pulse length can be set to OFF for observing noise in the water (Auto range will switch to manual mode). Set to AUTO, the optimum setting will be applied according to the water depth. Or it can be set manually, if a specific pulse length is required:

SHORT	less than 10m deep water
MEDIUM	between 10 and 50 m deep water
LONG	more than 50m deep water
☞ *A long pulse will reach deeper but give less resolution.*	

Range – refers to the distance shown from the top to the bottom of the display screen. Selecting **Auto range** will cause the EQXX to change the basic range setting(s) to keep the displayed bottom in the lower half of the display. For instance, as your boat moves into deeper waters, the EQXX will automatically switch to a deeper range, always keeping the displayed bottom in the lower half of the display. **Manual range** allows the operator to select a specific range.

Range start – allows the user to set the displayed depth range to begin at some point below the surface. For example, a 100 meter displayed range can be "phased" downwards, so that the screen shows a 100 meter section beginning at, say, 200 meters and going to 300 meters depth.

Scroll speed – is the rate of movement of the targets on the display screen, moving from right to left. It is adjustable, to allow the user to show a longer "history" on the display screen, if desired.

Scroll synchronization – the screen can be updated on the basis of time or distance (when data from last ping appears on the display).

Signal threshold – can be set to ON to eliminate the appearance of unwanted noise. The threshold level is automatic and the feature should be used with caution, as it may eliminate small fish and small unidentified objects on the screen.

Transducer – the transducer serves as the acoustic "loudspeaker" and "microphone" to send and receive the signals through the water.
Transducers are most often made from ceramic elements carefully built into a robust housing. The ceramic elements change shape when a voltage is placed across them (when the EQXX transmits a signal), and they also generate a voltage when they encounter sound waves (as when the EQXX receives an echo).

Transmit power – should normally be left on AUTOmatic. The modes available are: AUTO, 1000W, 500W, 100W and 10W.

TVG – Time Varying Gain – is a control that allows the EQXX to make corrections for most of the losses and absorption that occurs as sound energy passes through sea water.
There are three settings to choose from, Normal, Special and OFF.
The setting "Normal (20 log R) is for general fish finding at depths down to 50m (150') and it will also give a uniform bottom echo presentation at shallow, mid and deep water.
The setting "Special (40 log R) will adjust the TVG to show the same echo strength for a given size fish at varying depths.
The OFF position is used for net sounders. In OFF position the TVG is inactive which means that the sounder operates with a fixed gain between each transmitter pulse. Auto range is switched to manual.

VRM – Variable Range Marker – this refers to a horizontal black line shown on the display screen. The user can measure the range to targets shown on the display screen by use of the VRM. The depth to the VRM can be seen in the top left side of the screen for approximately 5 seconds after pressing the [VRM] key.

White line – is a control which places a white/black line at the displayed sea floor and blanks out 4 pixels just below the line. The purpose of this is to help the user detect targets, such as fish, which are very close to the sea floor and whose echoes tend to merge with those of the sea floor itself.

ZOOM – see Expansion.

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SIMRAD
A KONGSBERG Company

Simrad Støvring AS

Declaration of Conformity

The EMC Directive, Article 10 (1)

Undersigned are herewith declaring, that

Product: SIMRAD EQ42, EQ50, EQ52
Echosounder

is in accordance with the protection requirements in

the EMC Directive 89/336/EØF of May 3rd, 1989

Employed harmonized standards:

EN 60945:1993 / Amd.1:1993

Støvring 01 June 2002

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark

Odin Sletten
Product manager

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified below:

CATEGORY "A":
•Autopilots •Radars •Instruments •Navigators •Radiotelephones •Plotters •Gyro compasses incl. sensitive elements •Sonars •Echosounders •Trawl Instrumentation.
These products are warranted for a period of 24 months on parts and 12 months on labor from date of purchase, except for category B items. Consumable parts such as lamps, fuses, batteries, bearings, etc. are not covered by this warranty.

CATEGORY "B":
•Antennas •Transducers •Trawl sensors •Monitors (CRT/LCD) •Radar magnetrons •Disk drives.
These items are warranted for a period of 12 months on parts and labor from date of purchase.

WARRANTY SERVICE is available through authorized service dealers or national distributors worldwide. Products returned will, at the sole discretion of Simrad, either be repaired or replaced free of charge within normal working hours. Freight charges, insurance, duties or any other costs are the responsibility of the customer.
Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective.

ON BOARD SERVICE can be arranged by authorized local service dealers or national distributors upon request. Labor costs for the repair/replacement of the defective modules/parts will be free of charge provided a valid warranty is confirmed. Overtime, travel, lodging, per diem, insurance, duties or any other costs are the responsibility of the customer. Additional expenses connected with replacement of transducers such as dry docking, diving and precautionary measures are not covered by this warranty.

VALIDITY: This warranty is effective only when warranty certificate or proof of purchase and equipment serial number is presented. Furthermore, the installation and operation has to be carried out in accordance with the product manual. Warranty liability does not apply to any equipment which has become inoperative due to misuse, accident, neglect, sea water damage or unauthorized repair. Simrad will not be liable for any loss, incidental or consequential damages whether based upon warranty, contract or negligence, or arising in connection with the sale, installation, use or repair of the product. Consequential damages include, but are not limited to, any loss of profit, property damage or personal injury.
The terms of warranty as described does not affect your statutory rights.

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TO BE RETAINED BY THE OWNER

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark

SIMRAD
A KONGSBERG Company

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OWNER

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ADDRESS

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VESSEL

_____
HOME PORT

_____
TYPE

SERIAL NO.

_____
EQUIPMENT

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_____
DATE OF PURCHASE

_____
DATE OF INSTALLATION

YES:_____ NO:_____
INSTRUCTION FOR USE GIVEN

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified overleaf:

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AUTHORIZED INSTALLER/DEALER STAMP

tear out

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To be mailed to the NATIONAL DISTRIBUTOR (see overleaf) together with the installation report *WITHIN 14 DAYS* from the date of installation.

Simrad Støvring AS
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DK-9530 Støvring
Denmark

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VESSEL

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SERIAL NO.

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